



Additional chart coverage may be found in CATP2 Catalog of Nautical Charts.

SECTOR 6 — CHART INFORMATION

SECTOR 6

THE GULF OF THAILAND AND THE EAST COAST OF MALAYSIA

Plan.—This sector describes the Gulf of Thailand and the E coast of Malaysia, and includes the port of Bangkok (Krung Thep). The E and N shores of the Gulf of Thailand to Bangkok are first described. The W coast of the Gulf of Thailand and the E coast of Malaysia to **Tanjung Penawar** (1°31'N., 104°17'E.) are then described. The arrangement of the sector is N, NW, S, and then SE.

General Remarks

6.1 The Gulf of Thailand is one of the major coastal indentations of SE Asia. The gulf extends NW about 400 miles from its entrance to its head. The entrance is 205 miles wide between Mui Bai Bung, the SW extremity of Vietnam, and **Sungai Kelantan** (6°13'N., 102°14'E.), on the E coast of Malaysia.

The NE shore of the gulf is more indented and irregular than the W shore and the islets and dangers lie farther offshore.

The NW and W shores of the gulf are backed by coastal ranges that extend to the coast in places. This coast is composed of sandy beaches interspersed by ridges and rocky points. The hinterland consists of dense forests with numerous streams.

Most of the ports are small coastal trading centers. Bangkok, at the head of the gulf, and Chuk Samet Harbor, on the SE side of Ao Sattahip, are the only major ports.

The E coast of Malaysia between Sungai Kelantan and Tanjung Penawar, 310 miles SSE, is characterized by low swampy areas with numerous rivers discharging into the sea. Coastal ridges and hills extend to the coast at isolated points. In general, the off-lying islands are quite high and wooded. They provide good landmarks for coastal navigation.

Caution.—Several areas of the Gulf of Thailand, which are best seen on the appropriate chart, contain oil and gas fields with a network of pipelines. Lighted and unlighted structures, both above and below water are associated with these fields, and pose a danger to navigation. Specialized offshore tanker berths, complete with production platforms and storage barges are present, and will be described. Several pipelines, carrying petroleum and natural gas are laid on the sea bed of the gulf, and are best seen on the appropriate charts. However, not all the features are charted and vessels navigating in the vicinity are required to exercise special caution. Flares at structures may be seen from distances exceeding 20 miles.

Mariners risk prosecution by anchoring or trawling near a pipeline and damaging it. Gas from a damaged pipeline can cause a fire, or loss of a vessel's buoyancy.

Several areas containing production fields have been designated as restricted areas, and vessels not associated with them are advised to avoid the areas by as wide a margin as practicable.

East and North Shores of the Gulf of Thailand

6.2 Mui Bai Bung (8°37'N., 104°43'E.), the NE entrance point of the Gulf of Thailand, is low and wooded. Hon Khoai and the dangers SE have been described in [paragraph 5.51](#). The point is fronted by a coastal bank, with depths of less than 11m, extending 7 miles SW and 8.5 miles W, respectively, from the point. The coastal bank shoals sharply, and has depths of less than 1.8m close within its W edge. Depths of less than 14.6m extend up to 13 miles SW of the point.

A rock, uncovering 1.2m, lies 14 miles SW of Mui Bai Bung.

Hon Khoai is the primary landfall for vessels entering the Gulf of Thailand.

Caution.—An obstruction, reported (1914) to lie 19.5 miles WSW of Mui Bai Bung, was searched for unsuccessfully in 1917 and 1968.

An extensive unexamined bank, with depths of 14.6 to 18.3m, lies with its center lying 70 miles WSW of Mui Bai Bung.

Hon Chuoi, 150m high and wooded, is located 22 miles NNW of Mui Bai Bung; it is cliffy, steep-to, and appears as two islands from S. Hon Buong, 50m high, with a small islet off its E side, lies 4 miles SSE of Hon Chuoi. A rocky ledge extends 0.3 mile E of the islet.

Off-lying Islands and Dangers Between Mui Bai Bung and Chrouy Samit

6.3 The following islands and dangers lie up to 81 miles off the coast and outside the 20m curve between Mui Bai Bung and **Chrouy Samit** (Pointe Samit) (10°52'N., 103°07'E.), 166 miles NW.

Hon Panjang (Hon Tho Chau) (9°18'N., 103°29'E.), flat-topped and 167m high, lies 84 miles NW of Mui Bai Bung. The island has the appearance of a tableland. Two islets, the outer islet being 45m high, lie on a coral bank extending 2 miles ENE of the island. Rocher Blanc (Hon Da Bac), 23m high, lies 2 miles S of the SW end of the island. A reef, consisting of two rocky heads, with a depth of 1.2m, lies 1.2 miles ENE of Hon Da Bac.

Anchorage.—A bay on the W side of the island offers good anchorage and shelter, in depths of 29m, sand and coral. A rock, 0.6m high, with sunken rocks close E and W, lies 0.5 mile SW of the N entrance point of the bay.

Caution.—It has been reported (1998) that Hon Panjang and its associated islets may lie 1.3 miles E of their charted positions.

Hon Da Ban, 34m high, and Rocher Table, 12m high and 0.3 mile SE, lie 8.5 miles ENE of Hon Panjang.

Dewagougee Shoal, with a depth of 5.5m, was reported to lie 17 miles NNW of Hon Panjang. A shoal, with a depth of 7.3m, was reported (1961) to lie 3 miles NW of Dewagougee Shoal.

Poulo Wai consists of two wooded islets, separated by a channel 0.7 mile wide, with depths of 18.3m in the fairway. The W island is 91m high at its SE end. A light is shown from the E end of the W island. The E island is 61m high, and Rocher Saracen, awash, lies 0.8 mile NNW of the island. A rock, 0.9m high, with sunken rocks close E and W, lies 0.7 mile E of the E island. A patch, with a depth of 8.2m, lies 2 miles S of the latter rock, and an 8.5m shoal was reported to lie 7.5 miles E of Poulo Wai.

Recif Depond, which dries 0.6m, lies 12 miles ENE of Poulo Wai.

Anchorage.—Good anchorage can be found off the N side of the E island of Poulo Wai, but the best berth is in a depth of 14.6m, off the sandy bay on the NE side of the W island, 0.3 mile offshore.

Caution.—Vessels navigating in these areas should be in receipt of the latest Hydropacs and Special Warnings.

Ilot Veer (10°14'N., 102°53'E.), 36m high and steep-to, lies 18.5 miles N of Poulo Wai.

Kas Prins (Kaoh Pring), 61m high, lies 9 miles farther NNW. An islet, 46m high, and an islet, 7m high, lie 0.5 mile, and 1.5 miles, respectively, W of Kas Prins.

Kas Tang (Kaoh Tang), 10 miles ESE of Kas Prins, is wooded, inhabited, and 134m high at its N end. Ile Abri, a small islet, lies 0.5 mile N of the S entrance point of the sandy bay on the E side of the island. Another small islet lies 1 mile SE of Kas Tang.

Ilots Sud Est consists of two islets lying 4.5 ESE of Kas Tang. The NW islet is 43m high, and a shoal, with a least depth of 6.7m, extends 1.5 miles SSE of the SE islet.

Recif Condor, which dries 0.3m, lies 22 miles NNW of Kas Prins, and 17.5 miles WSW of Chrouy Samit.

Mui Bai Bung to Baie de Ream

6.4 Mui Ba Quan (8°46'N., 104°48'E.), 12 miles NNE of Mui Bai Bung, is the N entrance point of a shallow estuary.

The coast between Mui Ba Quan and the S entrance point of Vinh Rach Gia, 64 miles N, is low, wooded, and intersected by small streams. The coastal bank, with depths of less than 5.5m, extends 2 miles offshore along this stretch of coast. The only landmark along this coast is Hon Da Bac, 30m high, wooded, and standing close to the coast, 24 miles N of Mui Ba Quan.

A 5.8m shoal, existence doubtful, was reported (1965) 37 miles WNW of Hon Da Bac; a 9.2m patch was reported to lie 2.5 miles farther NNW.

Vinh Rach Gia has general depths of 0.6 to 1.5m. **Hon Tre** (9°57'N., 104°50'E.), cone-shaped and 323m high, lies near the middle of the bay entrance. The N entrance point of the bay rises to several peaks.

Rach Gia (10°01'N., 105°05'E.), a small port, lies at the entrance of a channel which provides access to a canal network extending to the Mekong River. The canal is navigable by boats with drafts of up to 1.8m.

Vung Cay Duong, close NW of Vinh Rach Gia, has depths of less than 5.5m and is backed by low land.

Mui Hon Chong (10°08'N., 104°39'E.), the W entrance point of Vung Cay Duong, is a rocky headland, 161m high. Rocher Sans Nom, 1.5m high, lies 4.5 miles SE of Mui Hon

Chong, on a bank with depths of 3.4m which extends 3 miles W of Rocher Sans Nom.

Mui Ong Thoa (Mui Hon Troc), 2 miles W of Mui Hon Chong, is a rocky headland. A range of hills, rising to an altitude of 201m, extends 4 miles NE of the headland.

Quan Dao Balua (Iles Balua) is an extensive group of islands extending 12 miles W and SSW of Mui Ong Thoa. Numerous rocks, reefs, and shoals, with depths of less than 5.5m, lie between and near the islands. A vessel should not attempt to navigate within the islands without local knowledge.

Hon Nghe (10°01'N., 104°33'E.), conical and 323m high, is wooded, inhabited, and lies 7 miles SSW of Mui Ong Thoa. It is the largest of the islands. Outer Island, 4 miles SW of Hon Nghe, is the S island of the group. A shoal lies 9.2 miles W of Outer Island with a least depth of 7.9m. Ile Escarpe lies 3.5 miles W of Hon Nghe.

Hon Heo (10°11'N., 104°32'E.), 102m high, lies 4.5 miles WNW of Mui Ong Thoa. Ile Ouest, 8 miles WSW of Hon Heo, is the W of Quan Dao Balua.

6.5 Quan Dao Nam Du (Iles de Poulo Dama) (9°41'N., 104°22'E.) in the approach to Vinh Rach Gia, consists of two parallel chains of islands in a N-S direction. **Hon Nam Du** (9°41'N., 104°21'E.), the principal island of the group, has a sharp peak, 309m high, near its center and a monument stands on the E side of the island, 1.5 miles from its S extremity. Hon Mong Tay, 103m high, lies 1 mile S of Hon Nam Du and a 4.6m steep-to shoal lies 0.3 mile S of Hon Mong Tay. A reef, with a depth of 0.9m, lies 1.3 miles W of the summit of Hon Nam Du; a rock, with a depth of 1.5m, lies 2 miles farther N. Hon Gian, 105m high, lies 1.5 miles N of Hon Nam Du. An islet, 48m high, with a rock above-water 0.2 mile W, lies 1.2 miles WSW of Hon Gian.

Hon Mau, over 61m high, and the S of the E chain of islets, lies 2.5 miles SE of the S extremity of Hon Nam Du. Hon Truoc, 90m high, and the N islet of the E chain, lies 1.5 miles E of the NE side of Hon Nam Du. Roche de l'Aspic, with a depth of 0.6m, lies 0.4 mile N of Hon Truoc; a rock awash lies 0.3 mile WNW.

Anchorage, during the Northeast Monsoon, can be taken in a depth of 12.8m, 0.5 mile SW of the W extremity of Hon Mau. During the Southwest Monsoon, the best anchorage for vessels with local knowledge is in a depth of 7.3m, good holding ground, E of the summit of Hon Nam Du, in the passage between the islands.

6.6 Hon Rai (Ile Tamassou) (9°48'N., 104°38'E.), 405m high, table-topped, wooded, and with a steep summit, lies 14 miles NE of Quan Dao Nam Du. A rock, with a depth of 0.6m, lies 0.3 mile off the W end of the island. A 3.2m patch, existence doubtful, lies 1.2 miles SE of the W end of the island.

Iles d'An Thoi (9°57'N., 104°02'E.) is a group of small islands and islets extending 6.5 miles S of **Mui Hanh** (10°01'N., 104°01'E.), the SW extremity of Dao Phu Quoc. Hon Dua, 101m high, the N island, is separated from Mui Hanh by a channel, about 0.5 mile wide, with a deep fairway. The channels between Iles d'An Thoi are apparently deep, but should not be used.

Hon May Rut, 87m high, lies in the SW end of the group. Hon Kim Qui, 53m high, and Hon Trang, 33m high, lie 0.5

mile NW and 0.3 mile SSE, respectively, of Hon May Rut. Hon Xuong, 75m high, and Hon Mong Tay, 0.5 mile S of it, are the SE islands of the group.

A 10.3m depth was reported (1966) to lie 5.5 miles W of Hon May Rut.

Hon Tay (9°49'N., 104°03'E.), 69m high, with a rock, 1m high, lying 0.3 mile W, is separated from Iles d'An Thoi by a channel 5 miles wide.

Hon Da Ban, 6m high, lies 1.2 miles SE of Hon Tay. A rock, 1.5m high, lies 0.8 mile E of Hon Da Ban. Hon Dong, 118m high, lies 3 miles ENE of Hon Tay.

Dao Phu Quoc

6.7 Dao Phu Quoc (10°15'N., 104°00'E.) is a mountainous island. **Nui Chua** (10°22'N., 104°03'E.), 565m high, the summit of the island, rises at the N extremity of a mountain range that dominates the E coast of the island.

Cay Dua (An Thoi) (10°01'N., 104°01'E.) is an important fishing harbor in the small bay E of Mui Hanh. There are two piers at Cay Dua. The W pier, 101m in length, serves as a fuel pier, and is supported by concrete pilings. The pier can accommodate vessels up to 152m in length and 4.2m draft.

The SW side of Dao Phu Quoc is mostly low with isolated hills rising inland. Sommet Carre, 161m high, rises close to the coast, 2.8 miles NNW of Mui Hanh. This coast is fringed by a bank with depths of less than 9.2m extending up to 0.5 mile offshore.

Duong Dong (10°13'N., 103°58'E.) ([World Port Index No. 57520](#)), the center of an important fishing industry, lies on the S side of a river entrance, 13 miles NNW of Mui Hanh. A large rock, surmounted by a white mast, with a pagoda nearby, lies on the S side of the river entrance.

Anchorage.—Anchorage can be taken in a depth of 11m, about 1 mile W of the light structure on the S entrance point of the river.

During the Northeast Monsoon, anchorage can be obtained anywhere off the SW side of Dao Phu Quoc.

Mui Dai Trai (10°22'N., 103°50'E.), the W extremity of Dao Phu Quoc, is backed by Day Nui Bai Dai, a range of hills extending 6 miles E. Hon Thay Boi, 18m high and wooded, lies 1.3 miles W of Mui Dai Trai; a 1.8m patch lies 0.4 mile ENE of the islet. Hon Ban, 14m high, lies 1 mile N of Hon Thay Boi. Hon Don Moi (Hon Do Moi), with rocks close off it, lies 2.3 miles S of Mui Dai Trai, and 0.5 mile offshore.

6.8 Mui Ganh Dau, the NW extremity of Dao Phu Quoc, lies 1 mile NNE of Mui Dai Trai. Rocher Plat, a rock above water, lies 0.8 mile N of Mui Ganh Dau; a rock, with less than 1.8m, lies 0.3 mile SE of Rocher Plat.

The island of Kaoh Ses, 89m high, lies 2.3 miles NW of Mui Ganh Dau. Ile Cone lies 0.5 mile W of the S extremity of Kaoh Ses, and a shoal with a depth of 3m lies 0.5 mile SSE of the same extremity. Kaoh Thmei, close NW of Kao Ses, has two summits; the highest, 172m high, rises in its N part.

Mui Kwala, the N extremity of Dao Phu Quoc, rises to Nui Chao, 382m high, 1 mile S. Nui Ham Rong, 366m high, lies 3 miles farther SSW. Dangerous ground extends nearly 2 miles W and N of the cape. Banc du Loire Inferieure, with a depth of 3m, lies 1.5 miles N of Mui Kwala, and is the N danger. A

shoal, with a least depth of 4.2m, extends 3 miles ENE of the cape.

The E side of Dao Phu Quoc is bordered by shoal water, with depths of less than 1.8m extending up to 4 miles offshore in places.

Nui Da Bac, 448m high, lies at the S end of the tableland mountain range on the E side of Dao Phu Qui. Nui Ham Ninh, 376m high, lies 3 miles farther SW. The village of Ham Ninh, where a light is shown, lies 1 mile SE of Nui Ham Ninh.

Mui Ong Doi, at the SE end of Dao Phu Quoc, is the SE extremity of a peninsula with a rounded summit, 120m high. Depths of less than 5.5m extend 3 miles SE of Mui Ong Doi.

Anchorage.—The irregularity of the bottom makes anchorage difficult off the E side of Dao Phu Quoc. Anchorage can be obtained in a depth 8.5m, about 3 miles E of Ham Ninh.

During the Southwest Monsoon, the most sheltered anchorage is in the bay NW of Mui Ong Doi, in depths of 10m.

Caution.—Exercise care when utilizing the coast of Dao Phu Quoc and the adjacent islands from Duong Dong to Hon Do Mai for position-fixing purposes. Some features on and off this coast have been reported to be incorrectly charted.

Islands and Dangers in the Approach to Ha Tien

6.9 Poulo Cici (10°12'N., 104°15'E.) consists of two islets, the N of which is 65m high and covered with trees. The islets lie near the S end of a bank, with depths of less than 5.5m, extending S of the coast between **Cap Bumbi** (10°32'N., 104°11'E.) and Pointe Kep (6.09), 8 miles ESE.

Rocher Rosita, which dries 0.6m, lies 4.5 miles NNW of Poulo Cici.

Iles Des Pirates (Quan Dao Hai Tac), a group of islands and islets, lie on a bank, with depths of less than 5.5m, extending 13 miles S of Pointe Kep. Vessels should not attempt to pass between the islands without local knowledge.

Hon Duoc (10°15'N., 104°19'E.), the S island of the group, lies 5 miles NE of Poulo Cici. Hon Doc lies 3.5 miles NNE of Hon Duoc.

Kaoh Tunsay, 155m high and wooded, rises 3 miles SE of Pointe Kep, and is the N island of the group.

6.10 Ha Tien (10°23'N., 104°29'E.) ([World Port Index No. 57530](#)) lies at the mouth of Rach Giang Thanh, which discharges 2.5 miles ENE of Mui Nai. Hills on either side of the river entrance form a gap that is conspicuous from SW. A light is shown on Mui Nai. Lights, in range 044°, on the NW side of the river entrance, are moved as necessary to conform to the channel over the bar; the range passes between a rock, with a depth of 1.2m, and a wreck farther E.

The bar at the river mouth has depths of 0.6m for a distance of about 100m. The mud, however, is very soft and vessels with drafts of 3.4m, and with sufficient power, can enter the river.

A quay on the N side of the river has depths of 2.4m alongside.

Anchorage.—Vessels drawing 4.6m can anchor 1.5 miles seaward of Mui Nai.

During the Southwest Monsoon, small vessels with local knowledge can anchor in a depth of 6.4m, about 0.5 mile E of Hon Doc.

Directions.—Vessels should approach between **Ile Ouest** (10°09'N., 104°24'E.) and **Iles des Pirates** and proceed to steer according to the range lights in line. Vessels should not enter the harbor without local knowledge.

Kampot (10°36'N., 104°11'E.)

World Port Index No. 57500

6.11 Kampot, the principal town of the area lies on the E bank of a river, 3.5 miles N of Cap Bumbi. There are three channels by which junks can enter the river; the E and best has a depth of about 0.6m on the bar.

Vessels of moderate size, with local knowledge, can approach to a position 6.5 miles SW of Cap Bumbi where anchorage in depths of 11 to 16.5m can be taken.

There are two approaches to the anchorage off Kampot. **Kinh Gan Dau** (Chenal Ouest), the channel N of **Dao Phu Quoc**, should be used by vessels with a draft of more than 4.6m. The depths in the fairway to the anchorage are not less than 10m. **Chenal Sud**, the channel E of **Dao Phu Quoc**, is only navigable by vessels with a draft of 4.6m or less.

Phnum Pouvanhone (Massif de L'Elephant), a range of mountains rising to an elevation of 1,000m, on the mainland N of **Dao Phu Quoc**, is very conspicuous when approaching Kampot. A round peak lies at the SE extremity of the range. **Pnom Dong**, 97m high, is conspicuous 1 mile N of Cap Bumbi. The N coast of **Dao Phu Quoc** was previously described in paragraph 6.7.

Pointe Kep (Chrouy Kab) (10°29'N., 104°18'E.), 7.5 miles ESE of Cap Bumbi, is prominent with a hill, 297m high, rising 0.5 mile inland.

Kaoh Kras (Koh Kras), 8m high, lies 5.5 miles W of **Pointe Kep**. **Ile Temple** lies 1.2 miles ESE of **Kaoh Kras**.

Anchorage.—Anchorage can be taken in a depth of 16.5m, with Cap Bumbi bearing 055°, distant 6 miles. Smaller vessels can anchor in a depth of 4.9m, about 1.5 miles S of Cap Bumbi, or W of **Kaoh Kras**.

Directions.—**Kinh Gan Dau** is the channel leading to the sea of **Chhak Veal Renh**. Vessels should steer to pass close N of **Hon Ban** and **Rocher Plat**, avoiding the 3.1m shoal lying 0.5 mile SSE of **Kaoh Ses**. Then steer to pass at least 2 miles N of **Mui Kwala** to avoid **Banc du Loire Inferieure** and the shoals off the cape. Then steer for the anchorage SW of Cap Bumbi, taking care to avoid the steep-to, rocky coastal bank on the N side of the fairway.

Vessels using **Chenal Sud** should round **Mui Ong Doi**, the SE extremity of **Dao Phu Quoc**, at a distance of at least 5 miles. Vessels then steer to pass W of **Rocher Rosita** (10°17'N., 104°21'E.) and E of the banks extending up to 4 miles off the E coast of **Dao Phu Quoc**. The E side of Cap Bumbi in range 000° with **Pnom Sor**, a 125m high hill standing 8 miles N, leads 0.5 mile W of **Rocher Rosita** and over 3 miles W of **Poulo Cici**. Care should be taken to avoid an obstruction lying 4.5 miles S of Cap Bumbi.

Baie de Ream

6.12 Baie de Ream (10°31'N., 103°36'E.), backed by high land, is fronted by five reef-fringed islands. A bank, with

depths of less than 5.5m, extends 2.5 miles from the head of the bay. Leading lights are situated on the SE entrance of the bay, and in line bear 348°.

Phsar Ream (Ream) (10°30'N., 103°36'E.) (World Port Index No. 57490) lies on the SE entrance point of the bay.

Kaoh Sra Maoch (Channel Island) lies 1.2 miles SE of the SE entrance point of the bay. **Kaoh Ta Kiev** (Bay Island), 115m high at its NW end, lies 0.8 mile W of **Kaoh Sra Maoch**, and is the largest island. **Kaoh Roessei** (**Kaoh Russei**) (Southwest Island), 105m high, is the SW island. **Kaoh Praeus** (Northwest Island) lies 1 mile WSW of the NW entrance point of the bay.

Rocher Blanc (White Rock), which dries 1.8m, lies on a reef that extends 0.5 mile SSW from the NW entrance point of the bay.

A concrete jetty, 45m long, close NW of the SE entrance point of the bay, has a depth of 3.7m alongside its head, and is accessible to vessels up to 61m in length.

The main channel, leading between **Kaoh Ta Kiev** and **Kaoh Sra Maoch**, has a least depth of 5.5m in the fairway. Lights in range bearing 348°, on the SE entrance point of the bay, lead into the main channel.

Vessels with drafts of less than 4.6m can enter by any passage between the islands, except between **Kaoh Sra Maoch** and the mainland.

Kaoh Khteah (Round Island) lies in the NW approach to the bay, 1.8 miles NW of the NW entrance point, and less than 1 mile offshore.

Anchorage.—**Baie de Ream** offers fairly secure anchorage during the Southwest Monsoon, off the NE end of **Kaoh Ta Kiev**. The best anchorage is in a depth of 11m, with the N side of the pier bearing 105°, distant 0.2 mile. Vessels should not proceed farther N of this anchorage as depths shoal sharply.

During the Northeast Monsoon, strong currents set in the channel. During the Southwest Monsoon a heavy swell enters the bay. At this anchorage, tidal currents have been observed setting N on the flood tide and SSE on the ebb tide, attaining velocities of up to 1 knot.

Chhak Kampong Saom

6.13 Chhak Kampong Saom (**Baie de Kampong Som**) is entered between a point close ESE of **Kaoh Poah** (**Koh Pos**) (10°37'N., 103°29'E.) and **Chrouy Samit** (**Pointe Samit**), 27 miles NW. The bay is sheltered from SW by a chain of islands extending SSE from **Chrouy Samit**. The N shore of the bay is low and bordered by mangroves. The N part of the bay is shoal and encumbered with fishing stakes. Vessels should not proceed to the head of the bay without local knowledge.

The port of **Kampong Saom** lies in the SE part of the bay.

Islands and Dangers in the Approach to Chhak Kampong Saom

6.14 Kaoh Rung Samloem (10°35'N., 103°18'E.), the S island in the approach, rises to an elevation of 210m in its NW part, and is thickly wooded; its SW and SE sides are steep-to. **Kaoh Kon** (**Ile Cone**), 157m high, lies close N of the island. **Chhak Saracen** (**Baie du Saracen**) indents the E side of the island, and have depths of 7.6 to 11m shoaling gradually towards its shores. No dangers lie more than 0.3 mile offshore.

Anchorage.—During the Southwest Monsoon, anchorage can be taken in a depth of 7.3m, about 0.3 mile off a cascade, at the SE end of a sandy beach in the S part of the bay. The NE part of the bay offers better shelter during the Northeast Monsoon.

Kaoh Rung, 2.2 miles NW of Kaoh Rung Samloem, is steep-to on its SW and NW sides. The island is wooded, and its summit is 317m high on its SW side. A bank, with a depth of 5.2m near its outer end, extends 3.5 miles NE from the NE end of Kaoh Rung. Banc de Kas Rung, with a least depth of 2.1m, lies on the SE part of the bank.

Anchorage, during the Southwest Monsoon, can be taken in depths of 7.3 to 14.6m, sand and mud, off the NE side of Kaoh Rung. Anchorage can also be taken in the bay on the SW side of the island.

Kaoh Ta Team (Ile du Chenal) and Kaoh Mano (Ile du Milieu), with an islet close N, lie 0.7 mile apart, about midway between Kaoh Rung and Chrouy Samit. The coastal bank, with depths of less than 5.5m, extends up to 4 miles offshore in the bay NE of Kaoh Mano.

Kaoh Damlong (Ile Plate) lies 2.5 miles SE of Chrouy Samit.

Kaoh Kaong Kang (Koh Kong Kang) (10°36'N., 103°25'E.) lies in the approach to Kampong Saom, midway between Kaoh Rung Samloem and the mainland. A reef extends 0.3 mile WSW from the island. A shoal, with a depth of 8.5m, lies 0.9 mile N and 1.2 miles S, respectively, of the E end of the island. A light is shown from the E end of Kaoh Kaong Kang.

Kaoh Poah (Koh Pos), close off the SE entrance, lies 1 mile WNW of Kaoh Poah. A light is shown from Kaoh Dek Koul.

Channels into Chhak Kampong Saom

6.15 The best channel into Chhak Kampong Saom is between Kaoh Rung Samloem and Kaoh Kaong Kang. This channel is 3.5 miles wide and clear, with depths of over 18m.

The passage between Kaoh Rung Samloem and Kaoh Rung has a least depth of 11m. However, a bank, with depths of less than 10m extends 3.5 miles SE from the SE side of Kaoh Rung, and a depth of 6.4m lies on this bank, 2.5 miles SE of the island. On the S side of the passage, a depth of 7.7m lies 1 mile E of the N extremity of Kaoh Kon.

Kaoh Ta Team (Ile du Chenal) lies in the middle of the passage between Kaoh Rung and Kaoh Mano (Ile du Milieu). There are least depths of 10.1m in the passage, but depths of less than 9.2m and 5.5m extend about 3 miles NNE and NE, respectively of the NE extremity of Kaoh Rung.

(For channels E of Kaoh Kaong Kang see Kampong Saom.)

Kampong Saom (Sihanoukville) (10°38'N., 103°30'E.)

World Port Index No. 57485

6.16 Kampong Saom is the principal port of Cambodia and the only port which can berth ocean-going vessels. The port extends from the quay S of Pointe Loune to Kaoh Preap (Rocher Preap) (Rocher Touffu), 1.5 miles NNE. The main pier extends W then SSW from Pointe Loune. A new pier extends 0.5 mile ENE of Pointe Loune, and is sheltered by a breakwater extending NNE of Pointe Loune.

A breakwater extending from Kaoh Preap to Pointe Dominique, 0.7 mile E, forms the N part of the new harbor. A breakwater also extends SSW of Kaoh Preap. Two visible wrecks lie inside this breakwater and another wreck lies close inside the breakwater at Pointe Loune.

An offshore pipeline berth is situated off Pointe du Depart, 3.5 miles NNE of Pointe Dominique.

Tides—Currents.—Tides at Kampong Saom are usually diurnal. The tidal rise is 1.3m at MHHW.

There are strong and irregular currents in the passage between Kaoh Poah and the mainland. The tidal currents at the main wharf run parallel with it. The maximum velocity is 1.5 knots, and the average rate does not exceed 0.5 knot.

A flag shown at the N end of the wharf indicates a N current at the wharf, and a flag shown at the S end of the wharf indicates a S current; during slack water no flag is shown.

Depths—Limitations.—The main pier extends W and SW from Pointe Loune and has a total length of 550m. The principal part of this pier is its SW arm which is 275m in length. It has been reported that two vessels with drafts to 9.5m can berth alongside its W side and two vessels drawing up to 7.5m alongside its E side. Near the inner end of the main wharf a breakwater extends SSW providing shelter to a lighter basin on the E side of which there is a lighter quay.

The entrance and turning basin in the S part of the new harbor were reported dredged to 7.3m.

The wharf in the S part of the new harbor has depths of 7.3m alongside. Two mooring buoys are established between the breakwater and the wharf.

The offshore pipeline berth at Pointe du Depart, which lies 13 miles SW of Rocher Blanc, has two moorings in depths of 15m, capable of accommodating tankers up to 220m in length and 11.5m draft. The facility at Pointe du Depart can accommodate tankers of up to 60m in length with drafts to 4.6m.

Rocher Thmor (Rocher Eiffel), 3m high, lies nearly 0.9 mile N of the NE extremity of Kaoh Poah. A 4m patch lies 0.3 mile NW of Rocher Thmor, and is marked by a buoy. A patch, with a least depth of 3.3m, lies nearly 0.5 mile E of Rocher Thmor, and is marked by a buoy.

A rock, with a depth of 1.6m, lies on a detached shoal, 0.3 mile NW of Kaoh Preap.

The deep passage between Kaoh Poah and the mainland has a least depth of 8.2m on the axis of the buoyed channel, with the white beacon on Pointe Loune bearing 031° 36'.

Aspect.—Two warehouses, easily identifiable from a distance, lie close S of Pointe Loune, and nearly parallel to the main pier.

A light is shown from the N tip of the breakwater at Pointe Loune. Kaoh Preap, 5.8m high and prominent, lies at the NW corner of the harbor.

A flare is conspicuous on Pointe du Depart, where there is a refinery.

Pilotage.—Pilotage is compulsory, and should be requested at least 24 hours prior to arrival. The pilot boards close NE of Buoy KS. Berthing is usually carried out in daylight only, while unberthing takes place day or night, weather permitting.

Regulations.—Navigation is prohibited within 0.5 mile of the tanker berth.

Anchorage.—Three anchorage areas are available to vessels awaiting a berth, a pilot, or working cargo. The N anchorage, situated N of Lighted Buoy A, has depths of 9.2 to 11m, good holding ground. The S anchorage, situated S of Kaoh Poah, is used as a lightering anchorage when the N anchorage is too rough. The anchorage has depths of 8 to 10m, mud. The tanker anchorage, in depths of 15.8 to 18m, lies 2 miles NW of Kaoh Dek Koul (Rocher Carre).

Directions.—The port is easy to approach by day or night. Vessels arriving during hours of darkness are advised to approach the port by entering between Kaoh Kaong Kang and Kaoh Dek Koul, passing about 0.4 mile W of the latter.

The most direct route to the harbor at Kampong Saom is via the deep passage between Kaoh Poah and the mainland. This route is marked by buoys and the beacon on Pointe Loune bearing 031°36'.

Vessels can also reach the harbor by the passage W of Kaoh Poah, which has a least depth of 7m. Vessels then pass N of Lighted Buoys "A" and "B", moored NW and ENE of Rocher Thmor. (See "Channels into Chhak Kampong Saom" section of [paragraph 6.15](#) for channels W of Kao Kaong Kang.)

Chrouy Samit to Laem Ling

6.17 The coast between **Chrouy Samit** (Pointe Samit) (10°52'N., 103°07'E.) and Chrouy Yai Sen (Pointe Yeay Sen), 22 miles N, is hilly near the coast, forming rocky bluffs with sandy bays between. The bays afford good anchorage with offshore winds.

A group of islands lies within 3 miles of the coast N of Chrouy Samit. Kas Samit, the S island, is 120m high.

Rocher Table, 60m high, is located 6 miles N of Kas Samit, and 3.5 miles offshore. A 7.3m rocky shoal extends 0.5 mile SW of the islet. Roche du Branlebas, which dries 0.3m, lies 2.3 miles NE of Rocher Table.

Ilots Kussat (Kaoh Putsa) consists of three islets. The outer islet is 90m high, and lies 1.5 miles SW of **Pointe Koh Kussat** (11°05'N., 103°06'E.).

Off-lying Dangers.—Rocher Kusrovie (Kaoh Kusrovie), 11m high, lies 17.5 miles W of Pointe Koh Kussat. Banc Ubon Boratit, composed of sand and coral, with a least depth of 1.2m, lies 1 mile N of Rocher Kusrovie.

Banc de Yai Sen, with a least depth of 12m, and Banc de Kas Kong, with a least depth of 12.8m, lie 9.5 miles NE and 13.5 miles N, respectively of Rocher Kusrovie.

Koh Kong (Koah Kong) (11°20'N., 103°00'E.) fronts Baie de Kas Kong (Chaak Kaoh Kong) a shoal bay between Chrouy Yai Sen and Lem Dam (Phum Lamdam), 12 miles N. The island is wooded and attains an elevation of 406m near its central part.

Ilot Cone (Kaoh Mul) (11°26'N., 103°00'E.), 1 mile NW of Lem Dam, is 37m high and joined to the mainland by a causeway. A light is occasionally shown from the islet. A pagoda is conspicuous at Kas Kapig, 1.5 miles NNE of Ilot Cone.

Koh Yor (11°35'N., 102°56'E.), 118m high and prominent, lies 10 miles NNW of Ilot Cone and appears as an island.

The coast is low and bordered by sandy beaches between Koh Yor and **Khao Hua Maew** (11°55'N., 102°47'E.), a rocky bluff, 71m high, 22 miles NNW. A mountain range, rising to

elevations of 300 to 600m and with its S end lying 4 miles N of Koh Yor, backs this coast 1 to 3 miles inland.

Ao Trat is entered between Khao Hua Maew and **Laem Nam** (Laem Sok) (12°03'N., 102°35'E.), 14 miles NW. The bay has depths of less than 5.5m except in its outer part, and there are drying flats at its head. A light is shown on Laem Nam, and on Laem Ko Pu, 7.5 miles N.

Anchorage can be taken in a depth of 7.3m, about 4 miles E of Laem Nam.

Off-lying Islands and Dangers

6.18 Ko Kut is the SE of a group of islands lying SSE of **Laem Ling** (12°10'N., 102°17'E.). It is a high, level island, rising to an elevation of 344m in its S part. A light is shown near the S end of the island (11°34'N., 102°36'E.).

Ko Mak, 4 miles NW of Ko Kut, has a rocky headland, 107m high at its W extremity. The channel between the two islands has depths of over 11m. Ko Rayang Nok, an 81m high islet, lies 0.5 mile S of the W extremity of Ko Mak. Ko Kradat, 57m high, lies near the middle of a coral flat extending 4.5 miles NE of Ko Mak. A depth of 5.5m lies 2 miles SE of the SE extremity of Ko Kradat. A rock, with a depth of 7m, whose position is approximate, lies 0.5 mile SSE of the 5.5m depth.

Ko Rang Yai (Ko Rang), 193m high, lies 3 miles WSW of Ko Mak. Ko Mapring, 70m high, lies 0.8 mile N of the latter island. Rocks, above and below water, extend up to 1 mile off the N end of Ko Rang Yai.

Hin Phrai Nam, awash, lies 2.5 miles NE of Ko Mapring.

Ko Chang (12°03'N., 102°21'E.), the largest island of the group, has several peaked hills intersected by rocky and precipitous ravines. The summit is a table peak, 744m high, in the SW part of the island.

Ko Khlum, 242m high, lies 3 miles SE of Laem Bang Bao, the SW extremity of Ko Chang. Hin Rap, 1.5m high, lies 1.5 miles W of the S end of Ko Khlum. A rock, 1m high, lies 1.5 miles NE of Hin Rap. A rock, with a depth of 5.6m, lies 0.5 mile E of Hin Rap.

Hin Luk Bat, 1.5m high, lies 2 miles WSW of Laem Bang Bao.

Ko Yuak (Ko Yauk), 40m high, and the NW of three islets, lies 5 miles NW of Laem Bang Bao, and 1.8 miles off the W coast of Ko Chang.

Hin Sam Sao (Hin Samsau), 2.4m high, and Hin Rai (Hin Rarb), 1.2m high, lie 1.5 and 2 miles, respectively, NW of Ko Yuak. Hin Rai, 2.5 miles offshore, is the outermost danger off the W side of Ko Chang.

Caution.—An area dangerous for anchoring or fishing due to mines lies up to 8 miles W of the W coast of Ko Chang and is best seen on the chart.

Chong Ko Chang

6.19 Chong Ko Chang (Ko Chang Chong), the channel between Ko Chang and the mainland, has depths of 6.4 to 9.2m in the fairway. Vessels drawing more than 4.5m should not use this channel without local knowledge.

Ko Ngam, 120m high, bordered close SE by rocks above and below water, lies close SE of the SE end of Ko Chang.

Ko Mai Si Yai (Ko Maisi Yai), 1.5 miles E of Ko Ngam, lies on the E side of the entrance to Chong Ko Chang. Several islets extend up to 2 miles E and ENE of Ko Mai Si Yai.

Ko Baidang, 125m high, and Ko Wai, 128m high, lie 2 miles SSW, and 3.5 miles SW, respectively, of Ko Mai Si Yai, in the S approach to Chong Ko Chang, and the W approach to Ao Trat.

The coastal bank, with depths of less than 5.5m, on the SW side of Chong Ko Chang, extends up to 1 mile from the NE side of Ko Chang. Ko Salak (Ko Lim), 60m high, lies on the SW side of the fairway, 6 miles NNW of Ko Mai Si Yai; a 4.6m patch lies 2.5 miles NW of the islet.

The coast on the N side of Chong Ko Chang is low and mangrove-covered. A light is shown at Ban Laem Ngop, 7 miles NNW of Ko Salak. The coastal bank, with depths of less than 5.5m, extends 1 mile off Ban Laem Ngop, and 6.5 miles offshore in the SE part, extending SW from Laem Sok to the islets off the SE end of Ko Chang.

Chong Ko Chang is entered from NW between Ko Chang Noi, 87m high, close off the NW extremity of Ko Chang, and Laem Ling, located 3 miles NNE.

Hin Khi Chang (Hin Kee Chang), 1.2m high, lies on the N side of the fairway, 3.3 miles E of Ko Chang Noi. A light is shown from Hin Khi Chang.

Anchorage.—There is anchorage in depths of 8.2 to 9.2m, about 0.7 mile SE of Hin Khi Chang. Small vessels can obtain anchorage in a depth of 4.6m about 1.5 miles SW of Ban Laem Ngop. Vessels approaching from NW should steer for the light structure on Hin Khi Chang bearing 110°, and then pass 0.1 to 0.2 mile S of the rock, and anchor when the structure comes in range, or opens SW of Laem Ling.

Laem Ling to Ko Saba

6.20 Laem Ling (12°12'N., 102°17'E.) is bordered 0.3 mile W by a rocky patch, awash. A hill, 163m high, rises 1 mile ESE of Laem Ling.

The coast between Laem Ling and the E entrance point of Mae Nam Chanthaburi, 20 miles NW, is low and fringed with mangroves.

Ko Chik Nok, 82m high, standing 5.5 miles NW of Laem Ling, fronts the mouth of Mae Nam Welu. The bar of the river, with depths of 1.8 to 2.1m in the fairway, extends 2 miles SW of Ko Chik Nok. A light is shown from the NW extremity of Ko Chik Nok.

Ko Proet, 65m high and connected to the coast by a spit, lies 10 miles NW of Ko Chik Nok. Ko Kwang and Ko Nang Ram, lie 0.5 mile SE, and 1 mile NW, respectively, of Ko Proet. Hin Phin, with a depth of 4.4m, lies 1 mile SSE of Ko Kwang.

Hin Bojesen, consisting of two rocks nearly 0.5 mile apart, each with a depth of 2.1m, lies 4 miles SW of Ko Proet. Hin Phut, two steep-to rocks above water, lies 6.2 miles SW of Ko Proet and is marked by a buoy.

Laem Sing (12°28'N., 102°04'E.), the W entrance point of Mae Nam Chanthaburi, rises to Khao Laem Sing, 172m high, about 0.8 mile NNW. A light is shown from the point.

Ko Nom Sao, 108m high, lies 2 miles W of Laem Sing. A rock, with a depth of 9.4m, lies 1.8 miles SSE of the islet. Khao Sa Bap rises to an elevation of 932m about 10 miles ENE of Laem Sing.

Mae Nam Chanthaburi is entered W of Laem Sing. The town of Ban Paknam stands on the low E entrance point, 0.8 mile farther N. Ko Chula, a 16m high islet, lies 0.4 mile SE of Laem Sing. Rocks, below water and awash, extend up to 0.2 mile N and SSW of the islet. Hin Sukhrip, with a depth of 2.3m, lies 0.5 mile SW of Ko Chula.

A rocky bank extends 0.1 mile E from Laem Sing, leaving a channel about 0.2 mile wide, with a depth of 3.6m in the fairway.

Vessels drawing 3.6m can proceed up the river 2.3 miles N of Ban Paknam, to Ban Laem Pradu, where there is a customhouse, church, and wooden pier, on the W side of the river. Vessels moor in the river as the tidal currents are strong.

Tha Chalaep, on the N bank of the river 1.7 miles farther N, is the port for Chanthaburi and is accessible to vessels of 2.7m draft. There is a jetty, with a T-head about 25m long, which can accommodate vessels of 500 tons and a draft of 3m at HW. Pilotage is not available.

Ao Mu Yai, a shoal bay, backed by a low and wooded coast, lies between Laem Sing and Ko Saba, 7 miles WNW. There are numerous fishing stakes off this bay during the Northeast Monsoon.

Ko Saba, 65m high, lies close off a prominent hilly point. Ko Luk Saba, a reef awash, extends 0.2 mile S of Ko Saba. Mae Nam Khem Nu, entered E of Ko Saba, is obstructed by a bar with a depth of 1.8m.

Ko Saba to Laem Samae San

6.21 Khao Khung Kraben (12°34'N., 101°53'E.), a promontory, 126m high, and joined to the mainland by a narrow isthmus, lies 5.5 miles NW of Ko Saba.

Ao Khung Kraben, entered N of Khao Khung Kraben, has depths of less than 1.8m, with mud and sand flats extending over most of the bay.

The coast between Khao Khung Kraben and Laem Thoraphim, 15 miles WNW, recedes to form a bight. The coast is hilly between Kao Khung Kraben and Khao Taphao Khwam, which rises to an elevation of 128m about 4.5 miles NNW; then the coast is low to Laem Thoraphim. A low hill, 44m high, lies close W of Laem Thoraphim, and Ko Khi Pla, 9m high, lies 1 mile WSW of the point, and 0.3 mile offshore.

The coastal bank, with depths of less than 5.1m, extends 2.5 miles off the NE shore of the bight. Islets and foul ground extend 8 miles S of the NW shore. **Ko Man Nok** (12°34'N., 101°42'E.), 5.5 miles SE of Laem Thoraphim, is the southernmost islet of the above group. The islet is 22m high and rock-fringed; a light is shown from the summit. Hin Loftus, the outermost danger of the group, is awash at LW, and lies 0.8 mile SE of Ko Man Nok. Vessels should not pass inside this group of dangers.

Caution.—Hin Ai Lop, which dries, lies 5.5 miles W of Khao Khung Kraben. Hin Ritthidet, with a depth of 3.7m, lies 0.7 mile SSW of Hin Ai Lop.

Hin Alhambra (12°26'N., 101°40'E.), a coral bank which uncovers, lies 13 miles S of Laem Thoraphim. Parts of the reef are reported to break in heavy weather. Depths of 0.3m lie 0.8 mile E and 0.3 mile W of its drying part.

6.22 The coast between Laem Thoraphim and Laem Ya, 14 miles WSW, is mostly low and wooded, except for a few isolated hills. **Laem Ya** (12°35'N., 101°25'E.) rises to an elevation of 121m close N. Khao Taphao Khwam, 551m high, rising 5.5 miles N of Laem Ya, is the S peak of a range of mountains extending 10 miles N.

Caution.—Ko Thalu, 65m high, and with rocks extending 0.3 mile S, lies 7 miles SW of Laem Thoraphim. Hin Klang Rong, which is awash, lies 1 mile N of Ko Thalu.

Ko Kudi (Ko Kut), 49m high, with the rocky islet of Ko Thai Khangkhao close S, lies 3.5 miles NW of Ko Thalu. It is the southernmost of a chain of islets and rocks extending 3 miles from the coast. Vessels should pass S of Ko Thai Khangkhao.

Ko Samet, with its N extremity lying 2 miles E of Laem Ya, is the largest island off this coast. The island is hilly, attaining an elevation of 112m at its N end. A light is shown from the NW end of Ko Samet.

Hin Khao, 7m high, and Ko Chan, 21m high, lie 1 mile NE and 0.3 mile S, respectively, of the S extremity of Ko Samet. Hin San Chalam, 1.5m high, lies 0.5 mile S of Ko Chan; rocks above water extend 0.2 mile E, and depths of less than 5.5m extend 0.3 mile SE of Hin San Chalam.

Chong Samet, the passage between Ko Samet and the mainland, has several sunken rocks and shoals with depths of less than 3.7m and should only be used by vessels with local knowledge. Marine farms have been established in the approaches to Chong Samet and in the strait itself.

The coast between Laem Ya and Laem Samae San, 27 miles W, is low and wooded, except for Khao Sap, 62m high, an isolated hill, located 2.5 miles NW of Laem Ya.

Hin But, with a depth of less than 1.8m, and marked S by a buoy, lies 2.5 miles W of Laem Ya. Hin Redang lies 1.3 miles NW of Hin But.

6.23 Mae Nam Rayong (12°39'N., 101°17'E.) discharges 9.2 miles WNW of Laem Ya; the bar of the river is constantly shifting, and the bar nearly dries. A light is shown close within the river mouth. A pagoda stands on the S side of the promontory. A pier is reported (1988) to lie 1 mile E of the mouth of the river.

Depths—Limitations.—A port area, enclosed by breakwaters, lies W of the mouth of Mae Nam Rayong. The pier is capable of accommodating a general cargo vessel up to 20,000 dwt and there are two berths for liquid cargo vessels.

Aspect.—Lights aligned 345°30' lead into the harbor. The channel to the port is marked by lighted buoys. Range lights in line 330° lead to the wharf.

Ko Saket, 7m high, lies 6.5 miles W of the entrance to Mae Nam Rayong, and 1.2 miles offshore. The islet lies on a bank, with depths of less than 1.8m extending 2 miles offshore.

Pilotage.—Pilotage is compulsory; the pilot boards near the fairway lighted buoy. Berthing and unberthing of vessels takes place during daylight hours only.

Anchorage.—Anchorage can be taken in depths of 7.3 to 12.8m S of Mae Nam Rayong light structure, but there is no shelter in either monsoon season.

Caution.—Marine farms exist in the approaches to, and in Mae Nam Rayong.

Head of the Gulf of Thailand—East Side

6.24 Laem Samae San (12°36'N., 100°58'E.), 58m high, is the E entrance point of the bight which forms the head of the Gulf of Thailand. Hin Chula, a rock marked by a light, lies on foul ground extending 0.2 mile E of Laem Samae San.

Islands and islets extend 8 miles S of Laem Samae San. **Ko Chuang** (12°31'N., 100°58'E.), 148m high, lies with its summit 4.5 miles S of Laem Samae San. Hin Lak Bet, 8m high, and Ko Chan, 38m high, lie 1 mile NW, and 0.5 mile E, respectively, of Ko Chuang. Two islets lie 0.3 mile off the NE end of the island. A light is shown from the summit of Ko Chuang.

Hin Chalam (12°28'N., 100°58'E.), 9m high, white and steep-to, lies 2.5 miles S of Ko Chuang. Hin Yai, a coral patch with a depth of 11m, lies 1.8 miles SSW of Hin Chalam.

Caution.—An ammunition dumping ground surrounds Hin Chalam.

Ko Samae San, 167m high and located 1.2 miles N of Ko Chuang, is the largest of the off-lying group of islands and islets. Ko Chang Klua, 28m high, lies 1 mile E of the S extremity of Ko Samae San. Hin Lak Kun Chae, 4m high, and Kho Kham, 64m high, lie 1 mile, and 1.8 miles, respectively, NW of the same extremity.

Ko Raet, 106m high, lies 0.3 mile S of Laem Samae San, and about the same distance off the NE end of Ko Samae San.

The coast between Laem Samae San and Laem Chao, 2.3 miles WNW, is indented by two bights with low and wooded shores, separated by a rocky point. **Laem Chao** (12°36'N., 100°57'E.), a rocky headland, 62m high, is bordered 0.5 mile WSW by Ko Chorakhe, a 57m high islet.

A submarine pipeline carrying natural gas has been laid from seaward to a position 9 miles W of Rayong, and is best seen on the appropriate chart. Vessels should exercise caution when anchoring in the vicinity.

Chuk Samet Harbor (Laem Thong Lang) (12°37'N., 100°55'E.)

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6.25 Chuk Samet Harbor is approached between Ko Chorakhe and Ko I Lao, 2.3 miles WNW. Ko Yo lies close NE of Ko I Lao, on the same reef. Ko Maeo, 16m high, lies 0.4 mile SE of Ko Yo, at the SE end of a bank, with depths of less than 5.5m. Ko Mu, 68m high, lies 1.3 miles NW of Ko Chorakhe with a breakwater, which shelters Chuk Samet Harbor, extending 0.5 mile from the SE extremity of the island. Ko Nang Ram, 29m high, lies on the E side of the harbor entrance, nearly 0.5 mile E of the breakwater head. The harbor consists of a tanker pier, connected to the shore by a pipeline trestle, on the E side of the harbor entrance, and deep-draft cargo berths farther N. There is a naval base at the port.

Winds—Weather.—The winds and swells in the area are strong only during the Southwest Monsoon (April through September). The prevailing winds are WSW at 5 knots in January; S at 6 knots from February through May; SW at 8 to 10 knots from June through September; and N at 5 to 6 knots from October through December.

The mean relative humidity varies from 68 percent in January to 82 percent in October. The mean temperature throughout the year is 13°C to 15.8°C.

Tides—Currents.—The tide at Ao Sattahip is usually diurnal. The tidal rise at MHHW is 2.1m.

In the channel between Ko Chorakhe and the mainland the tidal current sets NW on the rising tide and SE on the ebb, attaining a velocity of 1 knot to 1.5 knots. A 2 to 3 knot current has been reported in the entrance channel, running generally W with the flood and E with the ebb.

Depths—Limitations.—The buoyed channel to the harbor has depths of 8.9m across its seaward end, and depths of 9.4m in the fairway of the remainder of the channel.

The tanker berth has depths of 10.1 to 11m alongside and can accommodate a vessel of up to 250m in length with a draft of 9.1m.

Five general cargo berths are available to ocean-going vessels. The West Quay has a length of 540m and can accommodate three vessels of up to 180m in length with drafts to 9m. The North Quay is 350m long and able to accommodate two vessels of up to 150m in length with drafts to 7.8m.

Aspect.—In the approach, the lights on Ko Chuang and Laem Phu Chao are easily visible up to 20 miles on a clear day. The breakwater light may be seen up to 10 miles.

Lights, in range, on the W side of the cargo pier, lead through the buoyed channel to the harbor.

Pilotage.—Pilotage is compulsory, and is available only in daylight hours. Pilots board off the entrance to the buoyed channel. Contact Sattahip Port Control on VHF channel 16 from 35 miles distant from the point of arrival. The working VHF channel is 12. Vessels are requested to ensure arrival time is prior to 1600 hours as pilots will not berth during darkness due to the absence of navigation lights.

ETA should be sent at least 36 hours in advance along with the ship's length and draft. Vessels are required to keep continuous listening watch while approaching, at anchor, and moving within the harbor.

Anchorage.—Anchorage is available in depths of 22 to 31m over a bottom of shells and mud, in the two charted anchorage areas situated approximately 4 miles SW, and 3.5 miles WSW of Chuk Samet breakwater. These areas are exposed, and may not be tenable during the Southwest Monsoon.

A quarantine anchorage is situated 6 miles SSE of Chuk Samet breakwater, and can best be seen on the chart.

6.26 Ao Sattahip (12°38'N., 100°54'E.) is shoal and encumbered with several reef-fringed islands which lie in the approach and entrance. **Laem Pu Chao** (12°39'N., 100°51'E.) is the W entrance point of Ao Sattahip; a light is shown from the summit. Unauthorized entry into Ao Sattahip is prohibited.

Ko Tao Mo, 146m high, and the largest island, lies 0.8 mile SE of Laem Pu Chao.

Tides—Currents.—West of Kao Tao Mo the currents set NW on the flood and SE on the ebb attaining velocities of 1 knot to 1.5 knots. The tidal currents in the channel between Ko Tao Mo and Ko Phra flow in the same directions, attaining velocities of 1 knot.

Depths—Limitations.—Ko Phra, 103m high, lies 0.3 mile ENE of Kao Tao Mo. An oil pier with a T-head, 67m long, and a depth of 5.8m alongside, is situated on the N side of the W

end of Ko Phra. A prominent radio mast, with oil tanks close E, stands close SE of the pier. A drying bank, marked N by a lighted buoy, extends 0.3 mile N of the E end of Ko Phra. The approach to the pier from W is difficult and a vessel should turn and secure alongside, heading W.

An L-head pier extending S and W of Laem Thian, is 152m long and 18m wide, with a depth of 7m alongside. Two concrete LST ramps and mooring platforms are situated close E of the L-head pier.

In the narrow channel between Ko Tao Mo and the mainland there are least depths of 5.5m between the coastal banks.

Aspect.—The N coast of Ao Sattahip between Laem Pu Chao and Laem Thian, 2 miles E, is mostly hilly and fringed by stony beaches.

The buildings and radio masts of the naval base at Ao Sattahip extend N of Laem Thian.

Anchorage.—Anchorage, with local knowledge, can be taken, in depths of 6.4 to 8.2m, N of the NE end of Ko Tao Mo, but anchorage NE of the island has been reported to be unsafe, especially in the Southwest Monsoon.

Caution.—There are areas dangerous due to mines in the approach to Sattahip and Chong Kham.

A seaplane landing area is situated in the central part of Ao Sattahip. Vessels are prohibited from anchoring, fishing, or transiting the area.

Ko Kham Yai

6.27 Ko Kham Yai (12°42'N., 100°47'E.) is separated from the mainland by Chong Kham, which is about 1.7 miles wide. The S extremity of Ko Kham Yai lies 4 miles WNW of Laem Pu Chao, and the island rises to an elevation of 233m near its S end.

Hin Yai, 4m high, and Hin Ta, 5m high, lie 0.3 mile SE and 0.5 mile E, respectively, of the S extremity of Ko Kham Yai. A rock, with a depth of 1.6m, lies 0.3 mile E of Hin Yai.

The W side of Ko Kham Yai is fairly steep-to, and fringed by a rocky bank with depths of less than 1.8m extending 0.2 mile offshore.

A shoal, with a least depth of 4m, lies 1.5 miles N of Ko Kham Yai. A bank, with depths of less than 10m, extends 2 miles farther N.

Ko Kham Noi, a 37m high islet, with a small islet close N, lies 0.5 mile NNW of the NE extremity of Ko Kham Yai.

Hin Rang Kwian (12°48'N., 100°48'E.), a 9m high rock, marked by a light, lies 4.5 miles N of the NE end of Ko Kham Yai.

Chong Kham

6.28 Chong Kham is the strait between Ko Kham Yai and the mainland. Ko I Ra, 47m high and rock-fringed, lies in the middle of the S entrance to the strait. Hin Khi Sua, with rocks extending 0.2 mile SE, lies 0.3 mile NE of Ko I Ra. A light is shown from Hin Khi Sua.

Ao Thung Prong lies on the E side of the strait where there are depths of 13 to 22m in the fairway. A 9.4m patch lies 0.3 mile E of Hin Khi Sua.

On the W side of the strait, a bank with depths of 5.5 to 11m extends 1.5 miles SE from the SE side of Ko Kham Yai. Hin

Ki Pla, 11m high, lies 0.7 mile SE of the E extremity of Ko Khram Yai. An islet, 4m high, and a rock, with a depth of less than 1.8m, lie 0.3 mile W, and 0.4 mile ESE, respectively, of Hin Ki Pla.

Hin Wua Lai Khwai Wing, which partly dries, lies 0.8 mile NE of the E extremity of Ko Khram Yai.

Winds—Weather.—Winds and swells are strong in Chong Khram during the Southwest Monsoon. During the Northeast Monsoon season, commencing about mid-September, reasonable shelter from winds and swells are afforded in this area.

Tides—Currents.—The flood current sets N through Chong Khram and the ebb current S, with velocities of 1 knot to 2 knots. The current attains velocities of 2 to 3 knots W of Ko I Ra. However, tidal currents are difficult to predict in this area and will vary according to local winds, swells, and river currents.

6.29 Chong Khram—East side.—The coast from **Laem Pu Chao** (12°39'N., 100°51'E.) to Ko Klet Kaeo, 6.5 miles N, is composed of high rocky bluffs, with sandy bays between. Khao Hat Yao rises to an elevation of 290m, nearly 4 miles N of Laem Pu Chao. Ao Thung Kai Tia and Ao Thung Prong, in the S part of this coast, are separated from each other by a promontory which rises to an elevation of 186m. The bays have depths of less than 5.5m, and the 10m curve fronts the entrance points of these bays close offshore.

Thung Prong (12°42'N., 100°50'E.) ([World Port Index No. 57445](#)) lies close N of Ao Thung Prong. It consists of a T-shaped pier and Delong Pier, situated 0.3 mile N.

Tides—Currents.—The strong currents in Chong Khram create a significant hazard as they run under Delong Pier. Approaching Delong Pier at other than slack water can be dangerous. Tidal currents have been reported to attain velocities of as much as 6 to 8 knots in the vicinity of the piers at Thung Prong.

Depths—Limitations.—Map Pier, the T-shaped pier, a tanker berth, is 135m long, prolonged by dolphins, and can accommodate vessels up to 183m in length. The pier has depths alongside of 10.1m at MLW and 9.1m at LWOS. Vessels up to 8.5m draft can remain alongside at LWOS.

The Delong Pier has a length of 183m, with a depth of 12.8m alongside.

Pilotage.—Pilotage is not compulsory, but is strongly recommended due to the strong tidal currents.

Anchorage.—Anchorage, waiting for a berth or pilot, can be taken in least depths of 13.7m, good holding ground, NE of Ko Khram Yai between 12°43'N, and 12°44'N.

Between the port of Thung Prong and Ko Klet Kaeo, 74m high, located 3.5 miles N, depths of less than 10m extend 0.8 mile offshore. A bay, with low and wooded shores, indents the coast between Ko Klet Kaeo and **Laem Phatthaya** (Patthaya) (12°55'N., 100°51'E.), about 9 miles N. A bank, with depths of less than 6m, extends 2 miles S from a position lying 2 miles SSW of Laem Phatthaya; a least depth of 4.4m lies near the N end of the bank.

Off-lying Islets and Dangers

6.30 A chain of islets and dangers extends 2.5 miles offshore between Ko Khram Yai and **Laem Krabang** (13°05'N., 100°53'E.).

Ko Lin (Ko Rin), 108m high, lies 5.5 miles W of Hin Rang Kwian. Hin Ton Mai, and Hin Khao, each 14m high, lie 0.5 mile S and 0.8 mile NE, respectively, of Ko Lin.

Ko Phai, 138m high at its S end, lies 7 miles N of Ko Lin, and 11 miles W of Laem Phatthaya. A light is shown from the middle of the W side of Ko Phai.

Ko Man Wichai, 53m high and steep-to, lies 2.5 miles S of Ko Phai. Ko Klung Badan, 44m high, lies 1.2 miles N of Ko Man Wichai. Ko Hu Chang, a 2m high islet, lies 0.5 mile farther N.

Ko Luam, 108m high, lies 1 mile NW of Ko Phai, and is the westernmost of the off-lying islets. A bank, with depths of less than 6m extends 2.5 miles N of Ko Luam.

Ko Lan, 205m high, lies 5 miles E of Ko Phai. Ko Sak, 33m high, and Ko Khrok, 41m high, lie 0.5 mile N and 1 mile ESE, respectively, of the N end of Ko Lan. A rock, with a depth of 2.7m, lies 0.8 mile S of Ko Khrok. A rock awash lies 1.3 miles ESE of Ko Khrok, and is marked E by a buoy.

Laem Phatthaya to Ko Si Chang

6.31 Laem Phatthaya (Laem Patthaya) (12°55'N., 100°51'E.), a rocky bluff, rises to a hill, 98m high, about 0.5 mile SSE, on which stands a radio tower, marked by red lights. Ko Chun, low, rocky, and marked by a light, lies 1 mile N of Laem Phatthaya.

A shallow bay, with low and wooded shores, indents the coast between Laem Phatthaya and Laem Krabang, 9 miles N.

Ko Nok, 3m high and marked by a light, lies 4.5 miles SW of Laem Krabang.

Ao Phatthaya, close NE of Laem Phatthaya, is a popular beach resort. Excellent anchorage has been reported off Laem Phatthaya. Ships generally anchor in the vicinity of 12°56'N, 100°51'E, in depths of 16.5 to 24m, sand, reported good holding ground.

Approach to the anchorage can be made from SW or NW, but vessels generally favor the approach from SW due to currents which run in a SW-NE direction. Currents have been reported to attain velocities of up to 6 knots.

Laem Krabang is a hilly point, rising to Khao Laem Krabang, 100m high, about 0.5 mile N. Khao Pho Bai rises to 201m high, about 2.5 miles NNE of Laem Krabang.

6.32 Laem Krabang (Laem Chabang) (13°05'N., 100°53'E.) ([World Port Index No. 57475](#)), a multipurpose, bulk, and container terminal, situated on the Gulf of Siam has no depth limitation. This deep water port acts as a sub-port for Bangkok.

Depths—Limitations.—The port can accommodate vessels up to 60,000 dwt. Maximum draft is 13m.

The South Quay consists of four terminals. The multipurpose terminal, Terminal B1, has a cargo berth that will accommodate vessels with a length of 300m and has an alongside depth of 15m. Terminal B2, Terminal B3, and Terminal B4 are container terminals, each with a berth 300m

long and an alongside depth of 15m. Vessels of up to 13m draft can be accommodated at the South Quay terminals.

The North Quay consists of three terminals. Terminal A.1, a container terminal, has a 300m long berth with an alongside depth of 6.5m. Terminals A.3 and A.4 are bulk cargo terminals having alongside depths of 14m at the jetty, with berths to accommodate vessels carrying sugar and molasses.

Pilotage.—The pilot boards 1.2 miles W of Laem Krabang. Pilots can be contacted on VHF channels 13, 14, and 16.

Anchorage.—Anchorage can be taken in a depth of 14m off Laem Krabang in position 13°04'N, 100°50'E.

Ko Si Chang

6.33 Ko Si Chang is the largest of a group of islands lying 4 miles NW of Laem Krabang. Khao Sao Thong, 192m high, lies 0.5 mile S of the N end of the island, and is the island's summit. The middle of the S part of the island is a wooded tableland, 59m high, surrounded by hills rising steeply from the coast.

Ko Khangkhao, 77m high, lies 0.3 miles S of Ko Yai Tao, an islet close off the S end of Ko Si Chang.

Ko Thai Ta Mun, a 25m high islet, lies close SW of Ko Khangkhao, to which it is connected by a reef. A light is shown from the summit of the islet.

Hin Sampayu, 3.6m high and marked at its S end by a light, lies 0.6 mile NNW of the NW end of Ko Si Chang.

Hin Kong Nok, a group of rocks nearly awash at LWS, lies 0.6 mile ENE of Hin Sampayu.

Ko Kham Yai, 62m high, lies 0.8 mile off the NE side of Ko Si Chang. An obelisk, prominent from N, stands on the NW extremity of Ko Kham Yai. Hin Kong Nai, a group of rocks which partly dries, lies 0.3 mile NNW of the NW end of Ko Kham Yai, on a bank with depths of less than 5.5m extending 0.3 mile farther NNW.

Ko Kham Noi, 20m high, and Ko Prong, 9m high, lie 0.2 mile NE and 0.3 mile E, respectively, of Ko Kham Yai. Depths of less than 5.5m extend 0.2 mile S of Ko Kham Noi.

Ko Ran Dok Mai, 15m high and reef-fringed, lies little more than 0.7 mile SE of Ko Kham Yai.

Laem Wang (Laem Wat), a narrow promontory with a prominent obelisk on its extremity, lies on the E side of Ko Si Chang, nearly 1 mile W of Ko Ran Dok Mai. A light is shown from Laem Wang.

Caution.—The waters around Ko Si Chang in depths of less than 5.5m are dangerous for anchoring or fishing due to mines, but are open to surface navigation. Ko Si Chang Anchorage is usually approached from N. Laem Sommuk Anchorage is available for small vessels in case of adverse conditions at Ko Si Chang.

6.34 Ko Si Chang Harbor (13°10'N., 100°49'E.) ([World Port Index No. 57470](#)), in the NE part of Ko Si Chang, is utilized by vessels hampered by the bar of Mae Nam Chao Phraya. Vessels proceeding to or from Bangkok (Krung Threp) may either load from or discharge to lighters here.

Pilotage.—Pilotage is not compulsory.

Anchorage.—During the Northeast Monsoon, large vessels generally anchor between Ko Kham Yai and Ko Ran Dok Mai,

in depths exceeding 9m, with the S extremity of Ko Kham Yai bearing 315°.

During the Southwest Monsoon large vessels anchor N of Ko Kham Noi. Anchorage can be taken in a depth of 9m with the N extremity of Ko Si Chang bearing 253°, distant 1.2 miles. Anchorage, over good holding ground, was recommended (1974) in depths of 11 to 16.5m, with the NE extremity of Ko Si Chang bearing 245°, distant 1.8 miles.

Anchorage, sheltered from both monsoons, can also be taken in depths of 9.2 to 16.5m, between Laem Wang and Ko Ran Dok Mai.

Caution.—A stranded wreck lies 1 mile ENE of Laem Wang.

Sriracha (Ao Udom) (13°07'N., 100°53'E.)

[World Port Index No. 57460](#)

6.35 Situated on the mainland, 4 miles ESE of Ko Si Chang, the port is contained within a restricted area, the limits of which are best seen on the chart. There is one dry cargo pier and three tanker terminals.

Winds—Weather.—Occasional squalls may be experienced.

Tides—Currents.—The tidal rise at Ko Si Chang is 2.3m at MHHW, and 1.9m at MLHW.

A N set may be experienced with a rising tide.

Depths—Limitations.—The port is able to accommodate tank vessels up to 118,000 dwt, 274m in length, with drafts to 15.3m. Dry cargo vessels of up to 150,000 dwt, having a maximum length of 265m, and draft of 12.8m can be accommodated.

There are four berths at a 450m long jetty for the handling of scrap metals. Vessels of up to 60,000 dwt can be accommodated.

From N to S the berths at Sriracha Oil Terminal are:

Torc (Thai Oil Refining Company) Sea Berth consists of six mooring buoys at the seaward end of a pipeline. A tanker, 274m long having a maximum draft of 14m, can be accommodated. Torc Jetty lies on the pipeline 0.5 mile from the shore.

PTT Jetty, a gas separation terminal, extends 0.7 mile offshore. A pipeline with mooring buoys at its extremity extends NW from the jetty head. No. 1 Berth, which accommodates vessels up to 100,000 dwt, is situated at the head of the jetty, and Nos. 2 and 3 Berths, which accommodate vessels up to 5,000 and 2,000 dwt, respectively, are situated on a spur on the N side of the jetty. A tanker 280m long and having a draft of 15m can be accommodated.

Esso Sea Berth consists of six mooring buoys at the end of a pipeline. A tanker 274m long and having a draft of 15.3m can be accommodated. A platform flanked by dolphins is situated on the pipeline 0.5 mile from the shore and Esso Jetty, also on the pipeline, is 0.1 mile from the shore.

Vessels may berth both N or S at all berths depending on the tide and weather. Tankers berth in daytime only.

A hulk is moored offshore close N of the restricted area.

Aspect.—A conspicuous flare stands about 0.3 mile E of **Kaho Pho Bai** (13°07'N., 100°54'E.). A conspicuous radio

tower painted in red and white bands stands 1 mile SW of the peak.

Pilotage.—Pilotage is compulsory and is available during daylight hours only. The pilot and a berthing master board in position 13°07'N., 100°51'E, about 3 miles NNW of Laem Krabang.

The following information should be passed to Supply Operations Division (PPT):

1. Name and call sign of vessel.
2. Flag.
3. LOA, draft, and width of vessel.
4. ETA at terminal.
5. Nature of cargo, technical name, UN number (if applicable), and quantity.
6. Distribution of cargo (and that to be left on board).
7. Is vessel fitted with an inert gas system?
8. Any defects of vessel or its machinery which may affect navigation, safety, or the marine environment.

Port authority should be notified immediately if there is a change of more than 1 hour in vessel's ETA. Radio contact should be established 12 hours in advance through Bangkok.

Pilots should be contacted on VHF 24 and 6 hours in advance. Contact the terminal 3 hours in advance.

Anchorage.—Anchorage may be taken in an area 1 mile in radius, centered 13°04'N., 100°51'E in depths of 22m, mud and sand, good holding ground. Anchorage is prohibited within the restricted area.

Directions.—The following positions and courses mark a recommended track that reportedly give a least depth of 17m. From the position 12°43'00"N, 100°44'36"E, steer 000° to 12°56'14"N, 100°44'36"E.; then steer 022° to 13°00'N., 100°46'12"E. Proceed to steer 037° to 13°06'20"N, 100°51'00"E and then steer for the port.

Caution.—Vessels are advised to contact local authorities for the latest information on depths and approach routes.

Sea suction intakes are likely to get blocked by vegetation and floating garbage.

Ko Si Chang to Mae Nam Chao Phraya

6.36 Laem Samuk (13°19'N., 100°54'E.) rises to an elevation of 74m about 10 miles NE of Ko Si Chang, and appears as an island. Khao Phu, a 314m high hill, rises 5.5 miles SE of Laem Samuk. Khao Khieo, 798m high and located 4.5 miles NE of Khao Phu, is the highest of a range of hills along this stretch of coast.

Khao Phra Bat, 146m high, lies 7 miles NE of Laem Samuk, and is at the N end of the high land on the E side of the Gulf of Thailand. Mae Nam Bang Pakong, entered 10 miles NNE of Laem Samuk, is accessible only to small craft.

The coast between the mouth of Mae Nam Bang Pakong and the mouth of Mae Nam Chao Phraya, 22 miles W, is low and bordered with mangroves. This coast is fronted by a bank with depths of less than 11m, extending from 6 to 9 miles offshore. The bank is encumbered by fishing traps.

Mae Nam Chao Phraya Entrance (13°32'N., 100°36'E.) and Bangkok (Krung Thep) (13°45'N., 100°30'E.)

World Port Index No. 57450

6.37 Mae Nam Chao Phraya is entered at the head of the Gulf of Thailand between the fort at **Pom Phra Chulachomklao** (13°32'N., 100°35'E.) and a point 1 mile NE. The river provides access to the city of Bangkok, 25 miles upstream. Krung Thep (Bangkok) New Harbor lies 15 miles above the river entrance.

The entrance to Mae Nam Chao Phraya is fronted by a bar extending about 8 miles seaward. Extensive banks of mud and sand dry on the bar, which is encumbered with numerous fishing stakes. Lights may be shown from the stakes at night. A channel dredged to a depth of 8.5m leads across the bar for a distance of 10 miles to the river entrance.

Samut Prakan (Changwat Samut Prakan), a town situated 3.5 miles above the river entrance, is the quarantine station, where customs officials will board.

Winds—Weather.—At Bangkok during the day, winds from between S and SW predominate from February to June, and are from the SW and W from July to September, with an average of Force 2 on the Beaufort scale. Northerlies predominate from October to December, and the winds are variable in January, with the average being Force 1 to 2 in these months. At night, the wind is calm most of the time throughout the year, with the average wind being less than Force 1.

Tides—Currents.—The tidal rise at Bangkok Bar is 3.5m at MHHW and 3m at MLHW.

There are great irregularities in the time and heights of the tide on the bar. The morning tides are greater than the evening tides from October to March, or when the declination of the sun is S; the evening tides are greater than the morning tides from April to September. There are usually two tides per day, but at times the weak tide disappears and there is only one tide per day.

Depths are also affected by the wind, S winds increasing them. Depths will be increased when a strong NE or E wind is blowing in the gulf. Depths are reduced with strong W winds and heavy NW or W squalls when the flood current is retarded.

A typhoon in the South China Sea, in the vicinity of Mui Vung Tau has been known to decrease the depth of the bar by as much as 0.9m.

High tide at Bangkok is 3 hours after high tide on the bar. The river is at its lowest level in July and August, and at its highest level in February.

Outside the bar, the flood tidal current sets NW and the ebb sets SE; both attain rates of 0.2 to 1 knot. During the Northeast Monsoon the current occasionally sets W along the edge of the bar with considerable strength.

In the channel across the bar the currents follow the direction of the channel and are influenced by the tidal currents and currents from the river. They attain velocities of 0.5 knot to 3.5 knots.

At Bangkok, the tidal currents are usually weaker than the river currents from September to December; during this period the flow is almost continuously seaward. During the rainy

season the currents may occasionally attain velocities of 4 to 5 knots.

Depths—Limitations.—Entering vessels are restricted in the maximum length and draft they may carry over the bar to Bangkok. The maximum draft a vessel may possess when transiting the bar is calculated by adding a factor called the "Bar Adder" to the predicted height of tide at the bar as published in the Thai tide tables. The "Bar Adder" is dependent on the vessel's length, and is given below. In any event, vessels are restricted to a length of 183m and a maximum draft of 8.2m.

Length of Vessel	Bar Adder
128.4 to 135.6m	4.8m
135.6 to 143.3m	4.6m
143.3 to 152.4m	4.4m
152.4 to 161.5m	4.2m

Vessels of deep draft and lengths exceeding 150m should take into consideration their handling characteristics, and the winding nature of the fairway before attempting the channel. Vessels unable to cross the bar fully loaded can anchor off Ko Si Chang, or leeward of Laem Samuk during the Northeast Monsoon, and work cargo.

Three overhead cables span the navigable channel of the river. The first two, with vertical clearances of 71m and 53m, lie respectively 5 miles N, and 7.2 miles NNE of the fort at the river mouth. The third cable, with a vertical clearance of 40m, is situated 341 mile SE of the **Grand Palace** (13°45'N., 100°30'E.).

Four bridges cross the fairway from seaward to a point above the Royal Thai Navy anchorage. The lower two, situated 3 miles S, and 0.7 mile SSE of the Grand Palace, have moveable center spans. The two bridges above the Grand Palace have fixed spans.

Several submarine cables and pipelines cross the channel at various places, and are best seen on the chart.

By Thai regulation, all inbound cargo and passengers must be discharged at the Klongtoi Wharves, unless a special permit is obtained from the port authorities in advance. The wharf complex is situated in the approximate position 13°42'N, 100°35'E, and offers facilities for handling container, bulk, liquid, and general cargo. A row of 36 mooring dolphins off the complex offers seven mid-stream berths for vessels not exceeding 172m in length. Vessels loading cargo use these berths, as well as private wharves and other mooring berths throughout the harbor area.

Aspect.—The coast on either side of the river entrance is low and mangrove-covered, presenting no natural landmarks. The first conspicuous features seen will be the Bangkok Bar Pilot Light Station (13°23'N., 100°36'E.).

The harbor is divided into three zones, the limits of which are marked by pairs of obelisks, one on each riverbank. Zone II, situated roughly between the meridians of 100°31'E and 100°35.5'E is termed the New Port, and is of the greatest commercial significance. Zone I, which takes in the waterfront of Bangkok proper, is considered the old port. Royal Thai

Naval installations and anchorages are situated throughout the area.

Pilotage.—Pilotage is compulsory. The pilot may be boarded within about 0.3 mile of the Bangkok Bar Pilot Light Station, situated 13°23'N, 100°36'E. The ETA should be sent 48 hours, 24 hours, and 12 hours in advance.

The following information is required by the port authorities:

1. Vessel's name and nationality.
2. Last port of call.
3. ETA at pilot station.
4. Fresh water draft.
5. General cargo tonnage.
6. Any dangerous cargo.
7. If a heavy lift is required.
8. If fresh water is required.
9. Number of passengers.
10. Time of anchoring at pilot station if applicable.

Vessels should establish contact on VHF within 10 miles of port and maintain listening watch on channel 16.

Regulations.—In addition to a request for radio pratique, the harbormaster must be contacted at least 24 hours prior to arrival, and a request made to berth at Klongtoi Wharves. Departing vessels must notify the harbormaster at least 6 hours prior to leaving berth. Vessels requesting a berth, or a shift of berth should fly "T" of the International Code of Signals.

Customs and health officials will board in the river off Samut Prakan Changwat Samut Prakan (13°36'N., 100°36'E.).

Where the channel is divided by mooring berths or vessels are moored in midstream, the channel to the E of these obstructions shall be used by all vessels exceeding 50 tons.

A vessel drifting in the harbor shall fly "G" of the International Code of Signals forward, and shall keep to midstream or as near to vessels moored in midstream as safe navigation permits when being passed by a vessel with a following current.

Vessels anchoring off the seaward end of the bar channel should provide watchmen and adequate lighting, and should ensure that all ladders are kept up.

Signals.—Radio and VHF facilities are available in the port, and may be used to contact the port officials or pilots.

Tide and berthing signals are displayed from a flagstaff at the E end of a quay at the mouth of **Khlong Phra Khanong** (13°42'N., 100°35'E.).

A vessel in distress should use the following code groups via flashing light or signal hoist to summon assistance:

1. DQ—I am on fire.
2. ST—I require a police boat.

The above signals should be supplemented by the code group X, sounded on the ship's whistle. Vessels requesting assistance via VHF should use the above code groups, giving vessel's name and location in English.

Anchorage.—Vessels intending to cross the bar usually anchor about 2 miles SE of the Pilot Light Station, in charted depths of 12.5 to 14m. The dangerous goods, quarantine, and naval anchorages are situated 4.5 miles ESE, 6.25 miles E, and 2.5 miles E of the Pilot Light Station, respectively. The quarantine and dangerous goods anchorages have general depths of 14m, while the naval anchorage has lesser depths. A dangerous wreck lies near the center of the naval anchorage. If these anchorages become untenable, vessels can anchor off Ko

Si Chang, or in the Northeast Monsoon leeward of Laem Sommuk.

Vessels waiting for a berth or loading cargo usually anchor in midstream. The pilot should be consulted before anchoring.

Several areas prohibited to anchorage and the laying of submarine cables, pipelines, and other obstructions exist in the waters of the port, and are best seen on the appropriate chart.

Directions.—Taking into consideration the vessel's draft (See Depths—Limitations topic.), there may be a need to proceed to an appropriate anchorage and discharge cargo before attempting the bar.

Keeping a good lookout for fishing vessels and other traffic, proceed to the Pilot Light Station described above. Take care to avoid the charted anchorage areas, and the shoal area charted 3 miles E of the Pilot Light Station. The shoal has a least depth of 4.9m. Several dangerous wrecks are charted in the approaches to Bangkok. Dangerous wrecks are charted within the Naval Anchorage, and about 2 miles SSE of the Pilot Light Station, just W of the general anchorage. An extensive expanse of drying flats studded with fishing stakes fronts the coast in the vicinity of Mae Nam Chao Phraya, crossed only by the river entrance channel.

The channel is about 12 miles long, has a width of 100m in the reaches and 250m in the bends. The least depth in the middle of the channel is about 5m (1996). The fairway is well marked by beacons, buoys, and ranges, lighted and unlighted, some of which are moved as necessary as the channel shifts.

Caution.—See Pub. 120, Sailing Directions (Planning Guide) for Pacific Ocean and Southeast Asia for details on areas dangerous due to mines in the vicinity of Bangkok.

Gulf of Thailand—West Shore—Mae Nam Chao Phraya to Prachuap Khiri Khan

6.38 The coast at the head of the Gulf of Thailand, between the mouth of Mae Nam Chao Praya to the mouth of Mae Nam Mae Khlong, 37 miles WSW, is low and wooded. There are numerous fishing stakes off this section of coast and depths of less than 9m extend up to 11 miles off the coast.

Midway along the coast, the mouth of Mae Nam Nakhon Chai Si, obstructed by a shallow bar, is difficult to distinguish. A light is shown from the W entrance point of the river, at Ban Hua Phong. A radio tower, 64m high and marked by an obstruction light, stands 2.5 miles farther N, at Samut Sakhon.

Mae Nam Mae Khlong is fronted by a shallow bar and drying mud banks extending about 3.5 miles offshore. A radio tower, 76m high and marked by an obstruction light, stands 2.5 miles N of the river mouth.

Laem Phak Bia (13°02'N., 100°06'E.), a low point marked by a light, lies 20 miles SSE of the mouth of Mae Nam Mae Khlong.

A marine farm is situated 2.5 miles SSW of Laem Phak Bia.

A bank, with depths of less than 10m, stretches 24 miles S from Laem Phak Bia, and extends up to 9 miles offshore.

Khao Chao Lai, 372m high, rises 15 miles SSW of Laem Phak Bia, 3 miles inland from the coast.

A large cement factory and four storage silos are situated close S of Khao Chao Lai. A canal, 18m wide, extends 1.5 miles inland from the coast E of the factory. The canal entrance

is protected by parallel rock jetties extending 0.7 mile seaward. The depth of the jetty channel and canal is about 4m.

Khao Chong Muong rises to an elevation of 642m about 6 miles SW of Khao Chao Lai. Khao Pak Pla, 469m high, lies 7.5 miles farther SSE.

Hua Hin Light, 5.5 miles SE of Khao Pak Pla, is shown from a rock close offshore.

Khao Takiap, a 124m high hill, lies on a small headland extending prominently from the coast, 3.5 miles SSE of Hua Hin Light. Hin Sao, 3m high, lies 1 mile E of Khao Takiap.

Caution.—See Pub. 120, Sailing Directions (Planning Guide) Pacific Ocean and Southeast Asia, for areas dangerous to anchoring or fishing.

Ko Sai, a 35m high islet, lies 2 miles S of Hin Sao. Ko Sadao, 29m high, with Ko Khi Nok, 15m high, close E, lies 0.8 mile farther S.

A hill, 190m high, and **Khao Kalok** (12°20'N., 100°00'E.), 131m high, lie close to the coast, 1.7 miles SW, and 8 miles S, respectively of Ko Khi Nok.

Ko Kolam (Ko Koram), 197m high, lies 5.5 miles S of Khao Kalok.

Ko Sattakut, 150m high, and marked at its NE end by a light, lies 2 miles SE of Ko Kolam, and 0.5 mile NE of a hilly headland.

Khao Sam Roi Yot, a remarkable range of mountains, lies W of Ko Sattakut, and 5 miles inland. The two highest peaks, the highest 605m high, are located at the N end of the range. The range has the appearance of a serrated tableland at a distance, and is unlike any other land in the Gulf of Thailand.

Khao Mong Lai (Khao Ta Mong Rai) (11°50'N., 99°50'E.), a 269m high summit, is located at the N end of a promontory, 24 miles SW of Ko Sattakut. The sides of the hills forming the promontory fall steeply to the shore.

The stretch of coast between Khao Mong Lai and Laem Phak Bia is known as Chai Fung Somdet Phra Naresuan Maharat (the coast of King Naresuan the Great).

Prachuap Khiri Khan

6.39 The coast between the promontory called **Prachuap Khiri Khan** (11°48'N., 99°48'E.) and another promontory, 6 miles SSW, is indented by two shoal bays, separated by a third promontory. The heads of the bays are low, wooded, and marshy.

Ao Prachuap Khiri Khan, the N bay, is fringed by a drying coastal bank, and has depths of less than 5.5m. The town of Prachuap Khiri Khan lies in the SW part of the bay.

The promontory separating the bays rises to a conspicuous horn-shaped hill, 207m high. Ko Raet, 130m high and marked by a light on its summit, lies 0.5 mile NE of the promontory; a rock awash lies 0.5 mile SE of the drying coastal bank.

Ao Manao, the S bay, dries at its head, and has depths of less than 5.5m. Ko Luam, 122m high, is located in the approach to Ao Manao, 1.8 miles NE of the S entrance point of the bay. Ko I Aen, 82m high, is located inside the entrance of the bay, 1 mile WNW of Ko Luam.

Khao Khlong Wan (11°45'N., 99°48'E.), a conspicuous rocky horn, 250m high, is located 1 mile NE of the S entrance point of Ao Manao.

Caution.—See Pub. 120, Sailing Directions (Planning Guide) Pacific Ocean and Southeast Asia, for areas dangerous to anchoring or fishing due to mines.

An airplane target practice area extends 35 miles NE and 20 miles SE from Ao Manao. Navigation is prohibited in the area during aerial bombing exercises.

Prachuap Khiri Khan to Ao Chumphon

6.40 The coast between Khao Khlong Wan and Laem Mae Ramphuong, 37 miles SSW, is low, wooded, and regular except for a group of conical hills. The highest of these hills rises to 218m about 14 miles N of Laem Mae Ramphuong. Khao Noi, 165m high, lies 3.5 miles farther N and 2.5 miles inland.

This coast is relatively steep-to, all dangers lying within 2 miles of the coast except for Ko Chan.

Ko Phing, 63m high, with a rock awash close W, lies 1.8 miles S of Khao Khlong Wan. Ko Phang, 64m high, lies 0.8 mile farther SSW.

Ko Chan, 63m high, with another small islet close S, lies 7.5 miles SSW of Khao Khlong Wan.

Laem Mae Ramphung (11°11'N., 99°34'E.) is the S extremity of a peninsula which appears as an island from a distance due to the low elevation of the coast W of it; the point rises to an elevation of 248m.

A port has been constructed NW of Laem Mae Ramphung. The port is designed to handle steel, rubber, pineapples, and containerized cargo. The approach to the port is marked by a lighted buoy and a pilot boarding station, established 2 miles E of the headland.

An islet lies close N of Laem Mae Ramphung; a dangerous wreck lies 0.5 mile N of the islet.

The coast between Laem Mae Ramphung and Laem Yai, 18 miles SSW, continues mostly low except for a few isolated hills inland. About midway between the points, the coastal bank, with Ko Thalu, 89m high and flat-topped at its outer end, extends 4 miles seaward. Ko Sing lies on the coastal bank between Ko Thalu and the coast; Ko Sang lies 1.5 miles farther SSW. A shoal, with a depth of 4.3m, sand, lies 0.5 mile NE of Ko Sang.

Laem Yai, a prominent craggy headland, rises to an elevation of 301m, at the NE end of a peninsula. Laem Chong Phra, the S extremity of the peninsula, lies 2.5 miles SSW of Laem Yai. Ko Wiang, 247m high in its N part, lies close SW of Laem Chong Phra.

6.41 Off-lying islets.—Ko Rang, 100m high and exhibiting a light at its summit, lies 1.5 miles SE of the SW end of Ko Wiang. Ko Chikong, 51m high and with a rock awash close NE, lies 1 mile NNE of Ko Rang.

Ko Ran Kai, 30m high, and Ko Ran Pet, 26m high, the outermost islets, lie 3.2 miles ESE and 3.5 miles SE, respectively, of Ko Rang.

The coast between Laem Yai and Laem Kho Kwang, 27 miles SW, is hilly, rocky, and reef-fringed, except for several small coves. These coves dry at their heads and are suitable only for small craft.

Khao Yai Bang Chak, steep and marked by a beacon, rises to a height of 192m close to the coast, 9 miles SW of Laem Yai. Table Rock, 26m high, lies 2.5 miles S of the summit, and 0.5

mile offshore. Ko Khai, a 108m high islet, is located 2.5 miles farther S.

Laem Thaen, a small peninsula, with an elevation of 33m, projects from the coast, 3 miles SW of Ko Khai; there is a red cliff at its S extremity.

Khao Din So rises to an elevation of 350m and stands 5.5 miles SW of Laem Thaen. Laem Pho Bae, 5 miles farther S, rises to an elevation of 107m close inshore. A rock with a depth of 6.8m lies 2.7 miles E of Laem Pho Bae.

Laem Kho Kwang (10°31'N., 99°16'E.), 2 miles farther SSW, has a hill 56m high at its extremity which is connected to the coast SW by a low isthmus covered with trees. Another hill, 118m high, lies 1 mile SW of the point.

Off-lying Islands and Dangers in the Approach to Ao Chumphon

6.42 Ko Chorakhe, 42m high in its N end, lies 7 miles ENE of Laem Kho Kwang, in the NE approach to Ao Chumphon. A reef extends 0.5 mile W of the SW end of the island, and a shoal, with a depth of 6.8m, extends 0.8 mile farther W.

Ko Ngam Yai (10°30'N., 99°26'E.), 103m high, the outermost island in the approach, lies 9 miles E of Laem Kho Kwang. Hin Lak Ngam, an above-water rock, and Ko Ngam Noi (Ko Ngam Lek), lie close NNE and 0.3 mile S, respectively, of Ko Ngam Yai.

Ko Lak Ngam, 19m high, lies 2.2 miles SSW of Ko Ngam Yai. Hin Lak Mattra, 3m high, lies 2.5 miles farther WSW. A 5.4m depth and an 8.2m depth lie 0.5 mile W and 0.7 mile NNE, respectively, of Hin Lak Mattra.

Ko Kalok, 40m high and rock-fringed, lies 3 miles WSW of Ko Ngam Yai. Ko Thalu, 29m high, lies 1 mile farther SW.

Ao Chumphon (10°28'N., 99°16'E.) is entered between Laem Kho Kwang and a point lying 5.5 miles S. Hin Chumphon, a dangerous rock, lies 1.8 miles SE of Laem Kho Kwang. A shoal, with a depth of 3m, lies between Hin Chumphon and the shore WNW.

Ko Kho Thian lies on a reef close NE of the S entrance point of the bay. Ko Samet, 82m high, lies 1 mile NE of Ko Kho Thian. An 8.9m patch lies 0.7 mile E of the N end of Ko Samet, and a rock awash lies 0.3 mile W of the SW end of the islet.

Ko Mattaphon, an islet marked by a light, lies 2.5 miles W of the N end of Ko Samet, and 0.5 mile NE of the mouth of Mae Nam Chumphon.

Anchorage.—During the Southwest Monsoon, anchorage can be taken in depths of 7.3 to 9.2m, mud and sand, about 1.5 miles NE of Ko Mattaphon.

During the Southwest Monsoon there are numerous fishing stakes in Ao Chumphon.

Ao Chumphon to Lang Suan Roads

6.43 The coast between **Ko Kho Thian** (10°25'N., 99°19'E.) and Laem Tian, 4.2 miles S, has hills rising to elevations of about 100m close to the coast. Ko Maphrao, 55m high, lies 0.5 mile offshore midway along this coast.

A group of islands and islets, oriented NE, lies off the above coast, in the SE approach to Ao Chumphon. Ko Mattra, 132m high, with rocks extending a short distance NE and SW, is the outermost and highest of the group, and lies 4.5 miles ESE of

Ko Kho Thian. Ko I Raet, 94m high, lies 1.3 miles SW; Ko Lak Raet and other rocks above water lie close NE of Ko I Raet. A bank, with a least depth of 6.4m, is centered 1.8 miles S of the SW end of Ko Mattra. Ko Sak, 37m high, lies 2.5 miles NW of Ko Mattra.

Ao Sawi, entered between Laem Tian and Laem Pracham Hiang, 8 miles SSW, is a shoal bay with drying flats at its head. Several islets lie across the entrance of the bay. Ko Rang Kachiu, 69m high and the outermost islet, lies 2.5 miles SSE of Laem Tian.

Laem Pracham Hiang rises to Khao Pracham Hiang, 255m high. Ko Kula rises to a sharp peak, 175m high, about 1 mile NE of Laem Pracham Hiang.

The coast between Laem Pracham Hiang and the mouth of Khlong Lang Suan, 18 miles SSW is bordered by hills, 100 to 300m high.

Ko Mat Wai Noi, 47m high, with Ko Mat Wai Yai, 55m high, close S, lies 1.5 mile S of Laem Pracham Hiang. Ko Khang Sua, 60m high, lies 3 miles farther SSW, and 2.5 miles offshore.

Ko Rang Banthat (Ko Rang Prathat), 25m high and marked by a light, lies 2 miles S of Ko Khang Sua.

6.44 Nang Nuang Oil Field (10°07'30"N., 99°26'12"E.) consisting of a production platform to which a storage tanker is moored, is situated 14 miles ENE of Ko Rang Banthat. A light is exhibited from the production platform.

Depths—Limitations.—The depth alongside the terminal is 29m.

Four lighted buoys mark the extent of an area in which navigation is restricted within 500m of the production platform and storage tanker.

Pilotage.—Pilotage is compulsory for tankers berthing at the terminal, and can only be carried out in daylight hours.

Ko Phithak, 100m high, lies 0.4 mile NE of Laem Thong Sai. Hin Phithak, above water, lies on a ledge of rocks extending 0.5 mile E of Ko Phithak.

Laem Riu, 2.5 miles S of Ko Phithak, rises to an elevation of 119m.

Lang Suan Roads lies off the mouth of **Khlong Lang Suan** (Mae Nam) (9°57'N., 99°10'E.). The approach to the river is encumbered by rocks and shoals, and during the Southwest Monsoon, numerous fishing stakes may be encountered N and S of the river entrance. A light is shown from the entrance. The entrance lighted buoy (safewater) No. 1 is moored 0.6 mile ENE of Lang Suan Light structure.

Hin Thong Wo, a rocky shoal with a least depth of 7.7m, lies in the NE approach, 7 miles NE of Lang Suan Light. Hin Haeng, with a depth of 4.4m, lies 3.5 miles SW of Hin Thong Wo.

Hin Klang Ao, a stony patch with a depth of 3.1m, lies 5.5 miles SE of Lang Suan Light, and is the N danger in the S approach to Lang Suan Roads. Hin Hemawani, a 5.5m rocky patch, lies 2 miles SE of Hin Klang Ao.

A group of dangerous rocks lies up to 2.5 miles offshore abreast the mouth of Khlong Lang Suan. Hin Folk Hon (Hin Falkon), is the northwesternmost rock; Hin Charas is the southwesternmost rock of the group.

Anchorage.—It is reported that small vessels with local knowledge can obtain secure anchorage in the inner part of Lang Suan Roads, W of the inner line of dangers, in a depth of 5.5m, sand.

Lang Suan Roads to Chong Samui

6.45 The coast between the mouth of Khlong Lang Suan and Laem Duat (9°42'N., 99°10'E.), 15 miles S, is wooded and bordered by numerous dangers. The outermost dangers are Hin Chen Thale, with a depth of 8.6m, lying 12.2 miles SE of the mouth of Khlong Lang Suan, and Hin Phum, with a depth of 7.9m, lying 3.8 miles farther S.

Khao Khan Thuli, a prominent sharp peak, 247m high, is located 2.5 miles SSW of Laem Duat.

Khao Prasong, 372m high, located 7.5 miles farther SSE, is the most prominent feature on this part of the coast.

Ao Ban Don, a shallow bay, is entered 12.5 miles farther SE. The bay is entered between Laem Sui, a low point, and Laem Khung Mo, 14.5 miles ESE. Ko Prap, a 60m high islet, marked by a light on its summit, lies 6 miles WSW of Laem Khung Mo.

Anchorage.—Small vessels with drafts of 4m and over can anchor 6 miles N of Laem Sui.

Thathong (9°11'N., 99°22'E.), situated at the mouth of the Mae Nam Ta Pi river, is a general cargo terminal.

Tides—Currents.—The average fall and rise of tide is about 0.6m. Extreme tides are 2.5m.

Depths—Limitations.—The channel leading to the port is maintained at a depth of 4.8m.

There is one berth with an overall length of 194m and another with a length of 94m. Depth at the docks is 5m at MLLW.

Pilotage.—All vessels 1,000 gross tons and over are required to have a pilot.

6.46 A chain of islands and islets extends 28 miles N of **Laem Thuat** (9°20'N., 99°41'E.), which lies 10 miles ENE of Ao Ban Don. Ko Palikan, 22m high and marked by a light, lies 1 mile N of Laem Thuat.

Ko Tung Ku (9°48'N., 99°43'E.), the N islet of the chain, is 59m high, with a smaller islet close S. Ko Mae Ko (Ko Wao Yai), 100m high, lies 2.5 miles WSW of Ko Tung Ku. Islets and dangers extend 0.8 mile S of Ko Mae Ko.

Ko Nai Phut, 193m high, lies 4.5 miles S of Ko Mae Ko. Above-water rocks extend 0.3 mile N of Ko Nai Phut, and islets extend up to 0.8 mile W of the island.

Chong Nua, with depths of 13 to 22m, between the dangers S of Ko Mae Ko and the rocks N of Ko Nai Phut, is the N passage through the chain.

Ko Ang Thong, rising to 396m at its S end, lies 3 miles S of Ko Nai Phut, with numerous islets and rocks between. Ko Phai Ruak, 162m high, lies 2 miles E of the S end of Ko Ang Thong. Ko Wua Te, a 92m high islet, lies 0.8 mile SE of Ko Phai Ruak.

Ko Phaluai, 342m high, lies 3.2 miles S of Ko Ang Thong. Hin Hlak, above water, with a small islet lying 0.3 mile W, lies 0.2 mile N of the N end of Ko Phaluai. Ko Tao Pun, surrounded by rocks, lies 0.5 mile off the NW side of Ko Phaluai.

Chong Ang Thong, between Ko Ang Thong and Ko Phaluai, has a least depth of 6.8m in the fairway. The channel is entered from E between Ko Wua Te and Hin Hlak.

Islands, islets, rocks, and dangers lie S of Ko Phaluai, between the latter island and the mainland. The channels between are dangerous and shoal.

6.47 Chong Ko Tao (9°55'N., 99°55'E.) is a deep passage, separating **Ko Tao** (10°06'N., 99°51'E.) from Ko Phangan, 18 miles SSE. The passage has general depths of 22 to 35m.

Hin Bai, 14m high and steep-to, lies near the middle of Chong Ko Tao, 8.5 miles N of Ko Phangan. A submerged rock, with a depth of 11.3m, lies 4 miles WNW of Hin Bai.

Caution.—A circular area with a 5 mile radius, centered on Hin Bai, is declared a dangerous exercise area.

Ko Tao, 40 miles ENE of the mouth of Khlong Lang Suan, is 358m high near its NW end. An islet 170m high, with an islet close S, lies 0.8 mile off the NW extremity of the island. The N and E sides of the island are steep-to, and an islet lies 0.2 mile off its SE extremity. The bight on the W side of the island is foul up to 0.5 mile offshore.

A submerged rock, with a 5m depth, lies 4.5 miles SSW of the S end of Ko Tao; another rock, with a depth of 7.1m, lies 4 miles NW of Ko Tao.

Ko Phangan (9°45'N., 100°02'E.) attains an elevation of 627m near the middle of its N part. Ko Ma, an islet, lies close off the NW end of the island, and Ko Kong Nui, another islet, lies 0.5 mile off the W end of the island. Ko Kong Kiang lies 1.5 miles SW of Ko Kong Nui. Ko Phangan is the northernmost of islands and islets extending 37 miles NNE of **Laem Kho Khao** (9°13'N., 99°53'E.).

Chong Phangan, the passage between Ko Phangan and Ko Samui, 5 miles S, has depths of 13 to 20m in the fairway.

On the N side of Chong Phangan, Ko Kong Rin, 3m high, lies close S of the SE extremity of Ko Phangan. Ko Tae Nai lies 0.8 mile off the SW end of Ko Phangan with Ko Tae Nok lying nearly 1.5 miles farther W.

On the S side of Chong Phangan, Ko Kong Ok lies 1.2 miles NE of the NE extremity of Ko Samui, with numerous above-water rocks between. Ko Som, 2 miles WSW of Ko Kong Ok, has two above-water rocks and dangers extending about 1 mile W. Laem Na Lan lies 4.5 miles W of Ko Som and a depth of 1.4m lies 1 mile NE of the point.

A light is shown from Laem Yai, the NW extremity of Ko Samui.

Ko Samui, with its SE extremity **Laem Ret** (9°25'N., 100°01'E.) located 3.5 miles ENE of Ko Katen, is part of the province of Nakhon Si Thammarat. Khao Yai summit, 635m high, is located 4.5 miles N of Laem Ret. The island is covered with dense forest, and there are several villages.

6.48 Chong Samui is entered between **Laem Kho Khao** (9°13'N., 99°53'E.) and Laem So, the S extremity of Ko Samui. Laem Kho Khao is conspicuous, consisting of five peaks, one of which is 237m high. Khao Chai Son, 535m high, lies 2.5 miles NW of Laem Kho Khao. Hills back the coast NNW of the latter point, and depths of less than 10m extend up to 1.5 miles off the intervening points.

The W, and best, channel, lies between the mainland and Ko Wang Nai, 6 miles N of Laem Kho Khao. Ko Wang Nai, 72m high and rock-fringed, is marked by a light. The channel has depths of 10 to 14m in the fairway. The channel is partly encumbered by fishing stakes. A 10.1m patch lies 6 miles SE of Ko Wang Nai.

Ko Wang Nok lies 1 mile E of Ko Wang Nai; a rock, 52m high, lies 0.3 mile ESE of Ko Wang Nok.

Ko Rap, 2 miles farther E, lies nearly in the middle of the entrance to the strait. A rock, with a depth of 6.8m, lies 0.5 mile NE of Ko Rap.

Hin Nam Lai, above water and surrounded by foul ground, lies nearly 2 miles NW of Ko Rap. Ko Mat Khaeng lies 0.7 mile farther NNW.

Ko Katen, 225m high, lies nearly midway between Ko Mat Khaeng and the S extremity of Ko Samui. An islet 17m high and reef-fringed, lies close off the SW end of Ko Katen. Ko Mat Sum lies 1 mile E of the SE end of Ko Katen. Hin La Lek, 3m high in its E part, lies 1 mile N of Ko Mat Sum.

In the NE approach to Chong Samui, Hin Ang Wong, 0.7m high, lies on the E end of a detached reef, 2 miles SSE of Laem Ret, on the SE side of Ko Samui.

Khanom (9°14'N., 99°52'E.), is a small port which provides a bulk berth E of the delta of the Khlong Khanom. Vessels anchor in depths of 12.8m, over mud and sand, E of the river mouth. A conspicuous red and white chimney stands on the NW bank of the river.

There is also a jetty where vessels are moored to six buoys, three forward and three aft, to berth 3m off the jetty in a depth of 9.2m. Vessels should be able to provide six lines.

Caution.—A submarine power cable is laid from a position close E of the power station in a NE direction.

A wreck lies 0.6 mile NE of the river mouth.

6.49 Middle Passage.—Middle Passage is the wide passage between Ko Phangan and Ko Samui on the E side, and the chain of islands and islets extending N of **Laem Thuat** (9°20'N., 99°41'E.) on the W side. It leads from Chong Ko Tao to Chong Samui at its S end.

On the E side of the passage, Ko Kong Kiang and Ko Tae Nok and the dangers W of Ko Phangan were previously described in paragraph 6.47.

Mooring buoys, 2 miles SSE of Laem Yai, the NW end of Ko Samui, lie at the seaward end of a water supply pipeline; a can buoy marks the end of the pipeline.

Ko Mao Thap (Ko Ha), 2 miles WNW of Laem Hin Khom, the SW extremity of Ko Samui, is the outermost of five islets off the SW end of Ko Samui. Ko Thalu, with Ko Din close S, and Ko Malaeng Pong lie 0.5 mile NE and 0.5 mile SSE, respectively, of Ko Mao Thap.

On the W side of the passage, **Ko Tung Ku** (9°48'N., 99°43'E.) is the N islet. A bank with depths of less than 10m extends 12 miles E of Ko Ang Thong and 8 miles E of **Ko Chuak** (9°28'N., 99°41'E.). There are depths of 11 to 18m between the above bank and the dangers off Ko Phangan and Ko Samui.

Chong Samui to Songkhla Harbor

6.50 A restricted area, enclosing several oil and gas fields is situated 90 miles NE of Laem Talumphok.

Rectangular in shape, approximately 60 miles long in a N-S direction, and 25 miles wide in an E-W direction, the area encloses a region of producing oil and gas fields, with the associated structures both above and below water, which present a hazard to navigation. Vessels are advised to avoid the area by as wide a margin as is practicable.

Erawan Gas Field Terminal A (9°05'N., 101°19'E.) is connected by pipelines to four other lighted platforms; Platforms B through E, within its group, are situated 54 miles NE of Ko Kra. A single-point-mooring buoy (SPM) is situated 2.5 miles NE of Terminal A. Erawan group is also linked with pipelines to three other oil fields in the area. Baanpot Oil Field is situated 15 miles SSE of Erawan; Satun Oil Field is 16 miles NNE; and Platong Oil Field is 21 miles further N from Satun. Funan, Jakrawan, Kaphong and Surat Oil Fields have been more recently established within the restricted area as well.

The pipeline leads N passing close W of an explosive dumping ground centered 9°50'N, 101°15'E., and continuing N, landing 8 miles W of Rayong.

A storage tanker is moored 2.5 miles NE of Platform A at the center of Erawan Gasfield. Tankers up to 250m in length and up 100,000 dwt berth alongside to load.

Pilotage.—Pilotage is compulsory within the terminal area and boarding locations are specified by Marine Control, except when proceeding to anchor. When approaching Erawan Terminal from the E, the pilot boards at the anchorage in position 9°04'N, 101°25'E; from the W the pilot boards at the anchorage in position 9°05'N, 101°10'E. When approaching Platong Terminal from the N, the pilot boards at the anchorage in position 9°40'N, 101°29'E. Tankers can only berth in daylight hours, but can unberth at any time.

The vessel's ETA should be sent 72 hours in advance followed by 48 hour and 24 hour confirmations.

Regulations.—Vessels should report to Marine Control or to the Erawan Terminal when approaching from the following areas:

1. Vessels must approach from the E when heading to the Northern Export Anchorage by using the Northern Approach Lane and passing between 9°37'N, 101°35'E and 9°42'N, 101°35'E. Reports must be made to Marine Control before coming within 10 miles of the Restricted Area.
2. Vessels must approach from the W and keep clear of the Restricted Area when heading to the Western Export Anchorage. Reports must be made to Marine Control before coming within 10 miles of the Western Export Anchorage.
3. Vessels using the Eastern Approach Lane must report to Marine Control or the Erawan Terminal when passing:
 - a. 9°20'N, 101°35'E from the N.
 - b. 9°09'N, 101°35'E from the S.
4. Vessels using the Southern Approach Lane must report to Marine Control or the Erawan Terminal when passing:
 - a. 8°30'N, 101°31'E from the W.
 - b. 8°30'N, 101°37'E from the E.

Caution.—A number of wells lie outside the restricted area.

6.51 Laem Phlai Dam (9°05'N., 99°55'E.), located 8 miles SSE of Laem Kho Khao, rises to an elevation of 474m. Khao Phra, 814m high, lies 3 miles W of the point.

Laem Kho Kwang, 5 miles S of Laem Phlai Dam, rises to an elevation of 148m about 1 mile W of the point. A light is shown 0.7 mile NW of the point, and a rock awash, lies 0.7 mile NNE of the same point.

The coast between Laem Kho Kwang and the W entrance point of Ao Nakhon, 30 miles S, is low, and backed by a range of mountains with several prominent peaks 13 miles inland.

Ao Nakhon, a shallow bight, is entered between **Laem Talumphuk** (8°31'N., 100°08'E.) and the mouth of Khlong Pak Phaya, 4.5 miles W. Laem Talumphuk is a narrow curved spit, of coarse sand, with a group of trees on its extremity. A light is shown from the spit. The entrance of Khlong Tha Phae lies 3.7 miles NW of the mouth of Khlong Pak Phaya; a light is shown 0.8 mile above the entrance. Depths of less than 10m extend 7 miles N of Laem Talumphuk, and the point and the land behind are low.

Anchorage, during the Southwest Monsoon, can be taken in a depth of 7.3m about 4.5 miles NE of the mouth of Khlong Tha Phae.

Off-lying Islets.—**Ko Kra** (8°24'N., 100°45'E.), 162m high and marked by a light, lies 35 miles E of Laem Talumphuk. High Rock, 81m high, with another rock close W, lies 1.3 miles SSE of Ko Kra. Boat Rock, 1.2m high, lies 1 mile SW of High Rock.

The coast between Laem Talumphuk and Songkhla, 82 miles SSE, is low, sandy, and wooded in places. A range of mountains parallels this coast 30 to 35 miles inland. Depths of less than 10m extend 5 miles offshore in the S approach to Laem Talumphuk. Farther S, depths of less than 10m extend up to 3 miles offshore.

A large lagoon, entered from Songkhla Harbor, extends 45 miles NNW, and is separated from the Gulf of Thailand by a low sandy neck of land ranging in width from 2 to 10 miles.

Songkhla Harbor (7°13'N., 100°35'E.)

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6.52 Songkhla Harbor is entered between **Laem Sai** (7°14'N., 100°35'E.) and Hua Khao Daeng, 0.5 mile SW. A short breakwater extends NE from Laem Sai. A spit, parts of which dry, extends 2 miles NW of Laem Sai, and is crossed by a narrow dredged channel close NW of the breakwater.

Islets front the harbor entrance, and Khao Tang Kuan, 101m high, lies 1.5 miles SSE of Laem Sai. The W side of the harbor is hilly, with a range of hills, some over 150m high, extending 2 miles S of Hua Khao Daeng.

Tides—Currents.—The tidal rise at Songkhla Roads is 0.7m.

The tidal current sets NW along the coast outside the harbor while the tide is rising inside the harbor, and in the opposite direction when it is falling.

The current inside the harbor area attains a velocity of 2 knots.

Depths—Limitations.—The channel has a dredged depth of 9m and a width of 120m. There is a turning basin at the W end of the quay with a diameter of 300m.

There are three berths with a total length of 510m and an alongside depth of 9m. Vessels up to 20,000 dwt, 173m long, with a draft of 8.2m can be accommodated.

Aspect.—The channel is marked by lighted buoys and range lights.

Ko Nu (7°14'N., 100°36'E.), the highest islet, 74m high, lies 1.5 miles ENE of Laem Sai. Hin Luk Maeo Nok, a 1.5m high rock, lies 0.7 mile farther NE.

Ko Maeo, 30m high, lies nearly 1.5 miles NNW of Ko Nu. Hin Luk Maeo Nai, a reef with several rocks, the highest 4m high, lies 0.5 mile S of Ko Maeo. A rock with a depth of 3.3m lies 0.7 mile N of the SW end of Ko Maeo; a 3.7m shoal lies 0.2 mile SW of the rock.

A radio tower marked by obstruction lights stands 100m SW of Songkhla Light, and two pagodas stand on a hill located 1.5 miles WNW of the same light. An airfield lies SE of the town.

Pilotage.—Pilotage is compulsory. The pilot boards in the vicinity of the Entrance Buoy.

Regulations.—See Pub. 120, Sailing Directions (Planning Guide) Pacific Ocean and Southeast Asia for details on regulations pertaining to vessels in Thai waters.

Signals.—The port may be reached via VHF channel 16. The pilots may be contacted on VHF channel 14.

Anchorage.—It has been reported that three anchorage berths are available, in the following locations:

- 7°17'10"N., 100°36'15"E.
- 7°15'30"N., 100°37'45"E.
- About 0.8 mile E of Ko Maeo.

The anchorages have charted depths of 9.2 to 10.4m over mud and shells. Small vessels can anchor 0.4 mile W of Ko Nu.

Directions.—The turn into the harbor is reported to be difficult, and should be attempted only at slack water.

An overhead cable, having a vertical clearance of 40m, spans the channel 0.3 mile SE of the leading lights.

Caution.—Two dangerous wrecks lie 20 miles N and 30 miles NNE of Songkhla, respectively.

Fishing stakes are reported to extend up to 30m from the channel's sides.

Songkhla Harbor to Sungai Kelantan

6.53 A range of mountains extends S of Songkhla. Khao Thiamda, 277m high, and Khao Wang, 305m high, rising 4 and 10 miles, respectively, S of Songkhla, are part of this range.

The coast between Songkhla and Ao Pattani, 43 miles ESE, is mostly low. A projection lies about midway along this coast, with Ko Kham, a 40m high islet, 1 mile NE. Khao Khwang 221m high, lies 2 miles SSW of the projection.

Enemy Chaser Patch, 15.5 miles E of the projection, has a least depth of 3.3m, and lies at the N end of a shoal extending 3 miles offshore.

Ao Pattani, a shallow bay, is entered between **Laem Ta Chi** (6°56'N., 101°15'E.) and the mouth of Mae Nam Pattani, 2 miles S. The town of Pattani, 1 mile S of the mouth of Mae Nam Pattani, is a major rubber exporting center. Lighters which have to be taken over the bar of the river at HW are used in cargo operations.

A dangerous wreck, marked by a buoy, lies 2 miles NNW of Laem Ta Chi.

Laem Ta Chi is the extremity of a low, sandy spit, thickly covered with pine trees. A light is shown from the N side of the spit, 2 miles ENE of the extremity of Laem Ta Chi. Range lights are shown from the W entrance point of Mae Nam Pattani. A radio tower, 93m high and marked by obstruction lights, stands nearly 2 miles farther SSW.

A bank, with depths of less than 10m, extends 12.5 miles NNW of Laem Ta Chi.

Loftus Bank, consisting of hard sand, and rocks with depths of 1.5 to 3.7m, extends 5.5 miles ESE from a position about 2 miles NE of the N end of the above-mentioned spit; it is almost joined to the coastal bank near its W end.

Beating China Shoal, with a depth of 2.9m, lies 0.7 mile off the N side of Loftus Bank; rocks, with depths of 6.5 to 7.5m, extend 2.5 miles farther E.

Anchorage.—Small vessels can obtain anchorage in depths of 5.5 to 9.2m about 5 miles W of Laem Ta Chi. Large vessels can anchor in depths of 10 to 11m about 4 miles NW of Laem Ta Chi, particularly during the Southwest Monsoon (April to September), when the sea is calm. Ships are boarded by immigration and customs officers. There is no quarantine service, but ships are required to have a clean bill of health.

6.54 The coast between Ao Pattani and **Laem Khao Phra** (6°51'N., 101°33'E.) is low. Khao Maruat rises to an elevation of 322m about 2 miles WSW of the cape. Khao Yai, 475m high, lies 6.5 miles SSW of the cape.

Off-lying Islet.—**Ko Losin** (Pulau Lozin) (7°19'N., 101°56'E.), 2m high, lies 31 miles NE of Laem Khao Phra. A light is shown from the islet. Ko Losin is reported to lie 3.75 miles ENE of its charted position.

The coast between Laem Khao Phra and the entrance to Sungai Kelantan, 55 miles SE, is mostly low.

The entrance to Khlong Sai Buri, obstructed by a shallow shifting bar, lies 9 miles S of Laem Ko Phra. A light is shown on the S side of the river entrance.

Khao Nam Khang, 780m high, rising 9.5 miles SSW of the entrance to Khlong Sai Buri, is the N summit of a range of mountains extending SSE.

Hin Rakit, a white rock, 9m high and steep-to, lies 3.2 miles offshore, 6 miles ESE of the entrance to Khlong Sai Buri. Khao Tanyong, 294m high, conical and wooded, rises close to the coast about 17.5 miles farther SSE. A conspicuous dark hill, over 150m high and wooded, is located 3 miles S of Khao Tanyong.

Narathiwat (6°26'N., 101°50'E.) ([World Port Index No. 57432](#)), a small rubber and copra port, lies 3 miles NW of Khao Tanyong, 0.5 mile within the shoal entrance of Khlong Bang Nara. Cargo is lightered to the roadstead 1.5 miles off the river entrance. Vessels of light draft are able to cross the bar only at HW.

Sungai Kelantan

6.55 The delta of Sungai Kelantan is low and featureless, backed by numerous lagoons and waterways. Sungai Kelantan has two main entrances.

Kuala Besar (6°13'N., 102°13'E.), the E entrance is navigable only by boats. The depths are constantly changing,

and local knowledge is necessary. A light is shown close inside the E entrance point of Kuala Besar. Discolored water may be encountered several miles seaward of the entrance. The N extremity of the E entrance point of Kuala Besar is the SW entrance point of the Gulf of Thailand.

Kuala Tongkong, the W entrance to Sungai Kelantan, lies 4 miles W of Kuala Besar.

6.56 Tumpat (6°12'N., 102°10'E.) (World Port Index No. 57430) lies on the S side of the entrance of Kuala Besar. Kota Baharu lies 6 miles SE of Tumpat, on the W side of Sungai Kelantan. The principal export at Tumpat is iron ore. An airfield is situated 3.5 miles NE of Kota Baharu.

The port area of Tumpat is sheltered from seaward by a curved sandspit, but anchorage inside the sandspit is suitable only for small craft.

Depths—Limitations.—A jetty, 185m in length, projects from the coast about 1 mile WNW of Tumpat. The jetty is used to load iron ore into lighters. At night, when work is in progress, the jetty and immediate vicinity are illuminated by bright lights.

Aspect.—Pantai Sri Tujoh light is exhibited from a white wooden framework tower, 11m high, standing close within the W extremity of Tanjung Kuda.

Kuala Baru Tumpat lighted beacon, a white structure 5m in height, stands on a drying mud flat at the E end of the harbor, 1.7 miles E of Pantai Sri Tujoh Light and its position is approximate.

A light is also occasionally exhibited from a beacon situated 1 mile SW of Pantai Sri Tujoh light.

Anchorage.—Small vessels can obtain anchorage in a depth of 6.4m, soft mud, 2 miles NNW of Tumpat Light. Large vessels anchor farther offshore, remaining in depths of 11m or more, but the holding ground is poor.

Anchorage in a depth of 9.2m, mud, good holding ground, was reported to lie 1 mile N of the entrance to Kuala Besar.

Directions.—Vessels proceeding to Tumpat from SE should keep 2.5 miles from the coast until Tumpat Light bears 180° when course may be steered for the anchorage.

Caution.—A shoal, with a least depth of 3.1m, lies 2.5 miles NNW of Tumpat. A wreck with masts showing lies on the W side of the shoal.

Fishing stakes may be encountered up to 6 miles from the coast.

East Coast of Malaysia—Sungai Kelantan to Tanjung Penawar

6.57 The E coast of Malaysia between Sungai Kelantan and Tanjung Penawar, 310 miles SSE, is characterized by low swampy areas with numerous rivers discharging into the sea. Coastal ridges and hills extend to the coast at isolated points. In general, the off-lying islands are quite high, wooded, and good landmarks for coastal navigation.

Caution.—Fishing stakes may be encountered in depths of less than 15m off the E side of Malaysia.

Oil well structures, transfer platforms, and related equipment are situated off this section of coast.

Sungai Kelantan to Kuala Terengganu

6.58 A light is shown from a framework tower at **Sabak** (6°11'N., 102°19'E.), located 6.5 miles ESE of the E entrance to Sungai Kelantan.

The coast between Sabak and Sungai Besut, 25 miles SE, is low, sandy, and bordered by coconut trees. Depths of less than 11m extend up to 4.5 miles offshore, shoaling gradually shoreward.

The village of Bachok, where a light is shown, is situated 8 miles SSE of Sabak. Bukit Marak, a hill, 112m high, is conspicuous 5 miles WSW of Bachok. Bukit Gunong, with an elevation of 192m, is located 6 miles SW of Bachok.

Kuala Semarak, located 14 miles SSE of Bachok, lies at the entrance of Sungai Semarak, and is obstructed by a bar. A light is shown at the S side of the entrance. Batu Meninjau (Batu Maninjau), 514m high, is conspicuous 14 miles W of the entrance.

Sungai Besut, navigable only by boats, is entered 4 miles SE of Kuala Semarak. A fishing light is shown on the E entrance point of Sungai Besut.

Pulau Rhu, with an elevation of 110m, is located 3 miles E of the entrance to Sungai Besut, and 2 miles offshore.

The coast between Sungai Besut and Tanjung Merang, 30 miles SE, is low and bordered by sandy beach. Kuala Setiu Bharu, an inlet along the coast, lies 17 miles SE of Sungai Besut.

Pulau Chipu, a 23m high islet, scrub-covered and surrounded by shoal water, is prominent about 3.8 miles NE of Kuala Setiu Bharu. Baker Shoal, an 11.3m coral patch, and Dickson Shoal, a 12.8m coral patch, lie 3.5 miles N and 3.8 miles WSW, respectively, of Pulau Chipu.

A range of mountains, with many peaks, backs this coast, attaining its greatest elevation at Gunong Lawit, 1,519m high, about 17 miles SW of Kuala Setiu Bharu.

6.59 Tanjung Merang (5°32'N., 102°57'E.) has an elevation of 47m, and a conical hill, 204m high rises 2.5 miles S of it. A light is shown on Tanjung Merang.

Batu Rusa, two above-water rocks, the S of which is 2.7m high, lies 2.5 miles ENE of Tanjung Merang. Batu Tengah, 0.6m high, with a rock awash close SW, lies 0.8 mile N of Batu Rusa.

Batu Bara, 40m high, lies nearly 6.5 miles N of Tanjung Merang; three rocks, the highest of which stands 2.1m high, lie 0.8 mile NW of Batu Bara. Hafther Rock, with a depth of less than 1.8m, lies 0.7 mile SW of Batu Bara.

Batu Rakit, a small group of rocks, 0.6m high, lies 8 miles SE of Tanjung Merang, and 0.5 mile offshore. A light is shown on Batu Rakit.

The coast between Tanjung Merang and Kuala Terengganu, 16.5 miles SE, is low, but at Batu Rakit the high land approaches the coast.

An 11m patch lies 4.5 miles N of Batu Rakit. Depths of less than 11m extend up to 5 miles offshore in the vicinity of Batu Rakit.

Off-lying Islands and Dangers

6.60 Pulau Perhentian Kechil (5°55'N., 102°43'E.), 345m high in its S part, lies 7 miles NE of Pulau Rhu. Pulau Perhentian Besar, 321m high, is located close E of Pulau Perhentian Kechil, from which it is separated by a narrow foul channel. A coral patch, awash, lies 0.3 mile off the W side of the W island. A light is shown from the SW side of Pulau Perhentian Besar. Anchorage for small vessels with local knowledge can be taken in the S entrance to the channel between the islands.

Pulau Susu Dara, 199m high, lies 3.5 miles WNW of the N end of Pulau Perhentian Kechil. Pulau Serenggeh, 59m high, and Pulau Rawa, 55m high, lie nearly 1 mile S, and 1 mile E, respectively, of Pulau Susu Dara. A rock, 1.2m high, lies 0.5 mile WNW of the W end of Pulau Susu Dara. Several islets and rocks lie between Pulau Susu Dara and Pulau Rawa.

Churchill Patches, with a least depth of 13.7m, sand and shell, lies 7.8 miles N of Pulau Susu Dara.

Pulau Lang Tengah, 128m high, wooded, and cultivated in places, lies 8.5 miles SE of Pulau Perhentian Besar.

Pulau Redang (5°47'N., 103°01'E.), lying 14 miles ESE of Pulau Perhentian Besar, is the largest, highest, and outermost of the group of islands which lie off the coast between Kuala Semerak and Kuala Trengganu. Pulau Redang, thickly wooded, rises to an elevation of 359m in its N part. Pulau Lima, 76m high, lies 1 mile off the E side of Pulau Redang.

Pulau Redang Harbor, formed by islands off the S side of Pulau Redang, provides sheltered anchorage for small vessels. Pulau Pinang, 126m high, and reef-fringed on its NE side, forms the SW side of the harbor. A light is shown from the island.

The channel N of Pulau Pinang is for boats and is dangerous when the tide is in progress. A 5.2m shoal lies in mid-channel 0.3 mile ENE of the N end of Pulau Pinang. Connell Rock, a coral patch with a depth of 4.9m, lies 0.2 mile E of Pulau Pinang.

Pulau Ekor Tibu, 52m high, is located nearly 1.5 miles E of the E extremity of Pulau Pinang, on the S side of the E approach to the harbor. Pulau Chipor, 11m high, lies 0.5 mile WSW of Pulau Ekor Tibu. Batu Chipor, a round-topped rock, which dries 1.8m, lies 0.2 mile N of Pulau Chipor.

Pulau Koringo Besar, 15m high, lies on the S end of a reef extending 0.5 mile off the SE side of Pulau Redang, and on the N side of the E entrance to the harbor.

Anchorage.—Small vessels can find good anchorage in depths of 7.3 to 9.1m, with swinging room of about 300m, in the NW part of Pulau Redang Harbor. Larger vessels can anchor in depths of 16 to 18m, sand and coral, about 0.5 mile N of Pulau Chipor.

Anchorage can also be taken by medium-sized vessels in the bay on the N side of Pulau Redang. The bottom is fine coral sand and the holding ground is reported to be good, especially at the seaward end of the bay where the bottom is hard sand or clay. Approach to the bay can be made with a conspicuous rocky outcrop, located at the head of the bay, bearing about 200°; a thickly wooded hill lies in the vicinity of the rocky outcrop.

6.61 Pulau Yu Kechil (5°38'N., 103°10'E.), 71m high, is located 11.5 miles SE of Pulau Redang, and is the south-easternmost of the islets off this part of the coast. Pulau Yu Besar, 91m high, is located 1 mile NNW of Pulau Yu Kechil. An 11m depth is charted about 1.2 miles SE of Pulau Yu Kechil.

Pulau Bidong Laut, 293m high, lies 5.2 miles W of Pulau Yu Kechil. The island is thickly wooded and has several bays with sandy beaches on its W and SW sides. A submerged rock was reported (1945) to lie 0.3 mile N of Pulau Bidong Laut. Pulau Gelok, 107m high, lies 1.5 miles N of Pulau Bidong Laut. Pulau Tengkorak, 34m high, with a 9m high islet close N, lies 0.5 mile farther NNE. Pulau Kapak, 65m high and thickly wooded, lies 0.5 mile S of Pulau Bidong Laut.

6.62 Kuala Trengganu (5°21'N., 103°08'E.) ([World Port Index No. 57420](#)), a small coastal port, is fronted by a shifting bar, which had a least depth of 1.4m in 1972. The town of Trengganu lies on the S bank close within the harbor entrance.

Depths—Limitations.—Depths in the inner channel decrease from 9m at the river entrance to 2m above the inner navigational buoys. Four jetties, with depths of 3.7m alongside, are situated between the town and 1.5 miles upstream.

Aspect.—A fort lies on a 31m hill about 0.3 mile SW of the S entrance point of the harbor. A light is shown from a white brick pillar in front of the fort. Bukit Besar, a hill rising 2 miles S of the entrance, is surmounted by a radio mast with an elevation of 202m and marked by red obstruction lights.

Pilotage.—The pilot boarding place lies within a 1 mile radius of the fairway lighted buoy.

Anchorage.—Exposed anchorage can be taken in 9m, sand, with the light near the fort bearing 243°, distant 1.5 miles. Small craft with local knowledge can obtain good anchorage in a depth of 4.3m just within the entrance.

Kuala Trengganu to Tanjung Dungun

6.63 Tanjung Chenering (5°16'N., 103°11'E.), 74m high, is located 5 miles SSE of Kuala Trengganu, and is conspicuous being the only rocky headland in the vicinity. Bukit Panji, 203m high, is located 1.5 miles SW of Tanjung Chenering.

Pulau Kapas, 124m high and densely wooded, lies 5 miles ESE of Tanjung Chenering. An islet lies close off its NW end. A light obscured from seaward between bearings of 154° to 300° is shown from the S end of Pulau Kapas. Depths of less than 11m extend 1 mile NNW and SSE of the island. A 4.9m shoal lies 0.5 mile WSW of Pulau Kapas, on the coastal bank, with depths of less than 9m, extending between the island and the mainland.

Kuala Merchang, an inlet along the coast, is located 10.5 miles S of Pulau Kapas. Batu Siatin, 3 miles NNE of Kuala Merchang and 1.5 miles offshore, consists of two steep-to rocks, 0.2 mile apart, the outer rock with a least depth of 0.6m.

The coast from abreast Pulau Kapas to Tanjung Dungun, 28 miles SSE, is flat, covered with jungle and scrub, and backed by many low hills. A range of wooded hills is located 3.5 miles inland, in the S part of this coast; the range terminates at its S end in Bukit Laba, 232m high, 5 miles W of Tanjung Dungun. The 10m curve lies 1 mile offshore abreast Batu Siatin and

approaches to about 0.5 mile offshore abreast Tanjung Dungun.

6.64 Off-lying islands.—Pulau Tenggol (4°48'N., 103°41'E.), 283m high and densely wooded, lies 14.5 miles E of Tanjung Dungun. The island has three peaks, the N and center of which have twin summits. The island is steep-to and rocky, except for a small bay on its W side; there are several sunken rocks in the bay.

Anchorage, off the bay, can be taken in a depth of 48m, about 0.3 mile N of the S entrance point of the bay. An old light tower stands on the NE extremity of the island.

A bare rock, 10m high, lies 0.8 mile SSE of Pulau Tenggol. The channel between the rock and Pulau Tenggol has depths of 20m in the fairway and appears to be free of dangers.

Pulau Nyirih, lying 2 miles NNW of Pulau Tenggol, has two summits, the N and higher of which has an elevation of 108m. A rock, which dries 1.8m, and a rock with a least depth of 6.1m, lie 0.1 mile NNW, and 0.3 mile E, respectively, of the N point of the island.

A bare rock, 26m high and steep-to, lies 1 mile N of Pulau Nyirih. A small rock, 3m high, and another 4.6m high, each steep-to, lie 0.2 mile NW, and 0.8 mile ESE, respectively, of the above-mentioned bare rock.

6.65 Tanjung Dungun (4°47'N., 103°26'E.) rises to an elevation of 60m, and is marked at its summit by a light. The town of Kuala Dungun, 1 mile SW of Tanjung Dungun, serves the port and the iron mines at Bukit Besi, 19 miles inland, to which it is connected by a light railway. The port limits extend N to 4°47'00"N, E to 103°28'15"E, and S to 4°42'00"N.

Winds—Weather.—Vessels load and discharge into local lighters, but this is practicable only during the Southwest Monsoon season from about March 1 to October 31.

Depths—Limitations.—Sungai (Sungei) Dungun, discharging close SW of Tanjung Dungun, is accessible to vessels of 2m draft. A rest house is conspicuous 1 mile S of the W entrance point of Sungai Dungun; Sura Jetty is situated 0.5 mile farther S. Sura Jetty can only be used in calm weather. Mooring buoys are situated E of the rest house and Sura Jetty.

Pilotage.—Pilotage is compulsory for all ore vessels. Pilots board 10 miles off the coast. The pilot boat flies flag "H" of the International Code. Custom and immigration authorities board at the anchorage.

Anchorage.—Anchorage can be taken, in depths of 10m, mud and sand, about 1.5 miles E of Sura Jetty.

Tanjung Dungun to Kuantan

6.66 Bukit Bauk (4°42'N., 103°25'E.), 474m high and densely wooded, is located 5 miles SSW of Tanjung Dungun, and is the summit of a range extending SE to the coast. Bukit Belakang Parang lies 1 mile E of Bukit Bauk, in the same range.

Tanjung Labohan, 16 miles S of Tanjung Dungun, is marked by a light, and rises to Bukit Labohan, 378m high, about 0.8 mile NNW. Paton Bank, with a depth of 15.5m, is located 3 miles ENE of Tanjung Labohan.

Kertih Oil Terminal (4°34'N., 103°28'E.) ([World Port Index No. 57415](#)) is situated close N of Tanjung Batu Lata. Kertih

Control Tower light is shown from a gray metal framework tower, 35m high. A lighted yellow beacon is shown from Paka Power station cooling water intake nearly 2 miles N of the terminal.

Gas pipelines lead ENE from Kertih Oil Terminal to Tapis Marine Terminal and Sotong Platform, 108 miles NE and 86 miles E, respectively.

A T-head pier projecting to the 5m curve consists of three berths lying 4°35'N, 103°28'E. The pier is protected by a detached breakwater, lighted at its N and S ends, established close E. A buoyed channel leads to the berths.

Depths—Limitations.—Nos. 1 and 2 Single Anchor Leg Moorings (SALM), lighted, with sound fog signals, are situated 2.2 miles E and 2.7 miles ESE respectively of the terminal. Tankers between 40,000 dwt and 250,000 dwt can berth at them. The maximum loaded draft is 17.4m at SALM No. 1 and 20.4m at SALM No. 2.

A Single Point Mooring (SPM) is moored 1.3 miles ENE of the terminal, in a depth of 16.5m. A tanker between 15,000 and 85,000 dwt can berth there to load from a refinery ashore to a maximum draft of 11.1m.

Lighted Buoy No. 1 and Lighted Buoy No. 2 are at the 15m curve to mark shallow waters for deep draft tankers. A tug and a mooring launch attend during the mooring operations.

Pilotage.—Pilotage through the mooring master is compulsory. Pilots board, as follows:

1. About 4.5 miles NE of Tanjung Batu Lata Light.
2. About 5 miles E of Tanjung Batu Lata Light.

Regulations.—Vessels should send their ETA to Kertih Marine Control via telex upon departure from the previous port. The ETA should be confirmed 72 hours, 48 hours, 24 hours, and 12 hours in advance.

Vessels should contact Kertih Marine Control on VHF channel 16 when within range and maintain a continuous listening watch on that channel.

A Vessel Traffic Management System is maintained with radar surveillance encompassing the area within 24 miles of the port. The service provides vessels with advice on navigational conditions, traffic, weather, and tidal information upon VHF contact.

A restricted area extends about 5 miles seaward of the terminal. The N limit of the restricted area is marked by a lighted buoy moored 4.5 miles NE of Tanjung Batu Lata.

Caution.—A sudden outbreak of severe weather may be experienced in the area, resulting in the offshore current exceeding 3 knots. The currents are the result of the monsoon seasons. During the Northeast Monsoon (November-March) the current sets S and in the Southwest Monsoon (May-September) it sets N.

6.67 The village of Kemasik, from which a light is shown, lies 5.5 miles S of Tanjung Labohan. Batu Bau, with a least depth of 7.6m, lies 1.5 miles E of Kemasik. Caslon Bank, with a least depth of 13.7m, extends 4 miles NW of Batu Bau.

Tanjung Penunjuk (4°20'N., 103°30'E.) lies 11.5 miles S of Tanjung Labohan; a light is shown 0.8 mile NW of the point. Radio masts, marked by red obstruction lights at an elevation of about 335m stand on Bukit Kijal, 1.5 miles SW of Tanjung Penunjuk; the lights are visible for a considerable distance from NE and SE, but are obstructed from E. A shoal, with a

least depth of 11.3m, and Beting Karang Baru, with a depth of 10.7m, lie 3.5 miles NE, and 4.2 miles SE, respectively, of Tanjung Penunjuk.

Sungai Kemaman (4°14'N., 103°27'E.) discharges 6 miles SSW of Tanjung Penunjuk. Bukit Gemok, 174m high, is located close to the coast, 4 miles NNE of the river entrance. A light is shown from a hill close N of the E entrance point.

Vessels with a draft of 2.4m, with local knowledge, can enter the river. The entrance to the river is marked by lighted ranges.

Chukai lies 2 miles within the river entrance. Iron ore is exported through Chukai by lighters to vessels at anchor off the river entrance.

Two shoals, one with a depth of 4.2m and the other with a depth of 3.9m, lie 2 miles ESE and 2.5 miles SE, respectively, of the E entrance point of Sungai Kemaman.

Anchorage can be taken in a depth of 12.8m, mud and sand, about 0.7 mile SE of the E entrance point, with the light structure bearing 305°.

Kemaman Harbor (4°15'N., 103°27'E.)

World Port Index No. 57416

6.68 Kemaman Harbor is protected by East Wharf, which extends 850m SSW from Tanjung Berhala, and the S breakwater, which extends 730m E then N from Tanjung Sulung.

Depths—Limitations.—In the N part of the harbor the offshore oil and gas supply Base Wharf is 360m long with a depth of 7.8m alongside. The W side of East Wharf is 630m long, with a depth of 14.5m alongside for vessels up to 220,000 dwt and 13m draft. In the S part of the harbor, there is a berth at the head of the LPG terminal jetty for tankers up to 40,000 dwt and 12m draft.

A bank with depths of less than 11m extends 0.4 miles SSE from the head of East Breakwater. A rock, Batu Belacan, with a depth of 4.6m, lies 0.1 mile N of the S extremity of the bank.

Aspect.—The main channel leading to the turning basin in the harbor is 15m deep, and is approached from a position 2 miles SSE of Tanjung Berhala. Lighted Beacon No. 1 marks the channel, which is guided by two pairs of leading lights into the harbor. The first pair lead from lighted beacons Nos. 8 and 10 aligning on bearing 310°; the second pair lead from Lighted beacons Nos. 7 and 9 on bearing 327°30'. The fairway lighted buoy is moored on the alignment of the first pair of leading lights, 5.2 miles SE of the harbor entrance.

Lighted beacon No. 5 stands close S of East Wharf head. A light is shown from the head of the S breakwater.

Pilotage.—Pilotage is compulsory, except for offshore supply vessels, and is available between 0700 and 1900. The pilot boards at the channel entrance, about 2.5 miles SE of the head of East Wharf. Deep draft vessels are boarded about 5.5 miles SE of the head of East Wharf.

Anchorage.—The quarantine anchorage and the deep draft anchorage are situated NE of the approach channel and are best seen on the chart.

The petroleum anchorage is situated SW of the approach channel and is best seen on the chart.

The supply vessel anchorage is situated NE of the approach channel, 1.5 miles SE of Tanjung Berhala.

Coastal features.—Tanjung Geliga (Tanjung Guliga), 4 miles S of Sungai Kemaman, rises to an elevation of 92m.

The coast between Tanjung Geliga and Tanjung Gelang, 12.5 miles S, is low and featureless except for a 97m hill rising close to the coast, 1 mile N of Tanjung Cherating.

Offshore oil platforms are situated 100 miles W of Tanjung Geliga.

Oil fields on the W side of Main Route.—Kapak Natuna Oil Field and Terminal lie 30 miles NW of the main route between Singapore and Hong Kong. Platforms may also be encountered within 7 miles of either side of the main route, between S and SE of Kapak Natuna Oil Field.

Oil fields on the E side of Main Route.—Udang Oil Field is situated 40 miles NNE of Kepulauan Anambas and 20 miles SE of the main route between Singapore and Hong Kong. There may exist extended chains of platforms, particularly leading NW in Udang Oil Field, a distance of 2 to 5 miles E of the main route.

6.69 Tanjung Gelang (3°58'N., 103°27'E.) rises to an elevation of 112m. Bukit Pengorok, 196m high and conical, is located 2 miles farther NW. Beting Gebing, a shoal having a least depth of 3.7m, lies 2.2 miles NE of Tanjung Gelang. Depths of 6.7 to 11m extend 3.8 miles N, and 5.5 miles SSW of Beting Gebing. A 12.5m depth, and Skua Shoal, with a least depth of 10.3m, lie 3.5 miles E, and 4.5 miles SSE, respectively of Tanjung Gelang.

Tanjung Tembeling (3°48'N., 103°23'E.), located 10.5 miles SSW of Tanjung Gelang, rises to an elevation of 100m. A light is shown 0.3 mile N of the point. Bukit Pelindong, 267m high, is located 2 miles NNW of Tanjung Tembeling. A group of radio masts, 37m high, marked by red lights at the mast heads and green lights at the base of the masts, stands on the summit of Bukit Pelindong. The lights are visible a considerable distance to seaward. Red obstruction lights are shown at an elevation of 335m, from a conspicuous radio mast, 76m high, 0.3 mile farther E. Bukit Beserah rises to an elevation of 366m about 2 miles farther NW.

There are several obstructions, with depths of less than 9m, within 3 miles of Tanjung Tembeling.

Off-lying Shoals in the Approach to Kuantan

6.70 Asquith Shoal (3°44'N., 103°43'E.), with a depth of 12.3m, lies 21.5 miles ESE of Tanjung Tembeling. Boys Shoal, with a least depth of 13.7m, and Campbell Shoal, with a least depth of 11.2m, coarse sand and rock, lie 6 miles SE, and 10 miles SSE, respectively, of Asquith Shoal.

Elliot Shoal, with a least depth of 14m and Allen Shoal, with a least depth of 13.1m, extend 3.5 miles SSE and 4.5 miles S, respectively, of Asquith Shoal.

Haslam Shoals consists of fine sand and shells; the main shoal, 4 miles long in a N-S direction, has a least depth of 6.7m at its S end, which lies 6 miles WSW of Asquith Shoal. Robinson Rock, with a depth of 10.9m lies 3 miles SE of the main shoal, with depths of 11m between.

Herring Shoal, with a depth of 9.1m, lies 10 miles E of Tanjung Tembeling. An 11m shoal lies 3.5 miles farther E. Clark Shoal, with a depth of 8.2m, lies 2 miles SSE of Herring

Shoal. A 10.4m shoal, and a rock with a depth of 10.7m, lie 2 miles E and 2 miles ESE, respectively, of Clark Shoal.

Martin Ridge, composed of sand and rock, extends S for a distance of 9 miles from a position 8.5 miles ESE of Tanjung Tembeling. There is a patch, with a least depth of 7.3m at the N end, and there is a least depth of 6.7m about 2 miles from its S end.

Karang Tanjong, with a least depth of 4.9m, sand, shell, and shingle, lies with its shallowest part lying 3 miles SE of Tanjung Tembeling. Depths of 5 to 7m lie 1 mile SSW of the shallowest part, and depths of 6.7 to 9.4m extend 6 miles NNE of the shallowest part. Stork Rock, with a depth of 10.6m, lies 9 miles ENE of Tanjung Tembeling. An obstruction, with a depth of less than 6.4m, lies 0.8 mile W of the N end of Karang Tanjong.

Appleby Rock, Harris Shoal and Taylor Shoal, with depths of 4.2m, 5.5m, and 4.2m respectively, lie 5, 6.5, and 9.5 miles, respectively, SSE of Tanjung Tembeling.

Kuantan New Port (3°58'N., 103°26'E.)

World Port Index No. 57410

6.71 Kuantan New Port is situated on the N side of Tanjung Gelang; the **Old Port** (3°48'N., 103°20'E.) is located at the mouth of the Kuantan River, 11 miles SSW. The New Port is the only deep water port on the E side of the Malay peninsula and it can accommodate vessels of 45,000 dwt, except at the palm oil berth where vessels of 54,500 dwt can be accepted with a draft of 11.2m. The main exports are timber and palm oil.

There is a basin in the harbor and the harbor is protected by N and S breakwaters, each marked by a light at the head. From the basin entrance, the N breakwater extends SE and then SSE 1 mile, to a point 0.5 mile NNE of Tanjung Gelang Lighthouse. The S breakwater extends 0.1 mile from a point N of the same lighthouse.

Winds—Weather.—The wind is predominantly NE. The monsoon season is from November to February.

Tides—Currents.—The tidal range at spring rise is 3.5m. The predominant current sets N across the harbor entrance attaining a velocity of 2 knots, which decreases as it flows seaward. The current may reverse its direction to the S after a storm during the monsoon.

Depths—Limitations.—Within the breakwaters is a turning basin, 500m in diameter, with a least depth of 12.2m.

There are 11 berths in the port. A jetty, on the S side of the entrance to the basin, has inner and outer palm oil berths. The outer berth is 315m long for vessels with 11.5m draft and can accommodate vessels of up to 54,000 dwt. The inner berth is 150m long for a vessel with a maximum draft of 8m and can accommodate vessels of up to 8,000 dwt. At the N entrance to the basin, there is a jetty with mineral oil berth 150m long for vessels with an 8m draft.

On the S side at the W section of the harbor basin there are general and container cargo berths, numbered from seaward, with a total quayside of 750m for vessels having a maximum draft of 11.2m. The container berth is 225m long with an alongside depth of 11.5m. The three multipurpose berths have

a total length of 525m. Passenger vessels may dock at the multipurpose berths. The container, ro-ro, and multipurpose facilities can accommodate vessels up to 45,000 dwt. Stern-ramp vessels can also be accommodated.

The Chemical Berth and the MTBE Terminal, each have a length of 240m at which vessels of up to 53,000 dwt, having a maximum draft of 11.4m, can berth.

The Service Jetty, close N of the Naval Basin, is 140m long and has an alongside depth of 4m. Berth No. 1A is a coastal berth, 70m long in a depth of 8m.

Pilotage.—Pilotage is compulsory. Vessels are to forward their ETA at least 24 hours in advance and to confirm by VHF on channel 12, 13, or 16 at least 2 hours before arrival. Pilots board vessels at a point 0.3 mile E of the Fairway Lighted Buoy.

Anchorage.—Vessels of up to 13m draft anchor NE and SW of the approach channel, good holding ground of mud and sand, although this anchorage is exposed to the Northeast Monsoon.

Directions.—From the pilot boarding place the channel leads in a straight line for a distance of 3 miles to the breakwater entrance. The leading lights, bearing 311°04', will guide a vessel in maintaining the centerline of the channel; it is 220m wide and dredged through a ridge 1.5 miles SE from the breakwater entrance. The channel has a least depth of 12.2m. An underkeel clearance of 3.5m is required to enter harbor during the Northeast Monsoons.

Caution.—A dangerous wreck, marked by a lighted buoy, lies 0.6 mile ESE of Tanjung Gelang. Another dangerous wreck lies 1.1 miles ENE of the point.

6.72 Tapis Marine Terminal A (4°31'N., 105°01'E.) (World Port Index No. 57417) is situated within a restricted area that should not be entered by unauthorized vessels. Several groups of platforms from the surrounding oilfields are connected by pipelines. Dulang Platform is situated 5 miles NW of Semangkok Platform. A tanker mooring buoy is established 1 mile S of Dulang Platform.

Pipelines are laid from Tapis Terminal and Sotong Platforms WSW to Kertih Terminal. Semangkok Field, with two platforms, is situated 47 miles WNW of Tapis Marine Terminal A; Sotong Collector Platform is situated 42 miles SSW of Tapis Marine Terminal A; and Kakap Oil Field is situated 55 miles SE of Tapis Marine Terminal A. Two Duyong Platforms are situated 24 and 29 miles ENE of Satong Platform.

A platform, with a SPM close E, is situated 40 miles E of the E Duyong platform.

Pilotage.—Pilots board in the waiting area 17 miles SSW of the storage tanker, where ships usually remain underway. Port radio station and administrative offices are aboard the storage tanker.

Sungai Kuantan (3°48'N., 103°21'E.), entered 1.7 miles W of Tanjung Tembeling, provides access to Kuantan, which is the outlet for a considerable tin mining industry. Kuala Kuantan, the mouth of the river, is fronted by a drying bank. A dredged channel, marked by a lighted range and lighted buoys, leads across the bank. The channel is subject to constant change, especially during the Northeast Monsoon; the range lights and buoys are moved as necessary. No vessel should enter the river without local knowledge.

Tides—Currents.—The tidal rise at Kuantan is 2.7m at MHHW and 1.8m at MLHW.

Depths—Limitations.—The river is accessible to vessels of up to 3m draft. The main wharf in the harbor is 43m long, with a depth of 2.1m alongside, and a depth of 4.9m a short distance off. A private wharf, close SW of the main wharf, has depths of 3m alongside. Two T-head oil jetties, on the N side of the river, have depths of 5.5 and 5.8m alongside.

A bank, with depths of less than 5.5m, extends up to 2 miles offshore for a distance of 5 miles SSW of Tanjung Tembeling.

Two 5.5m patches lie 1.8 miles S, and 2.2 miles SSW, respectively, of Tanjung Tembeling.

Aspect.—A cluster of three oil tanks stands on the N bank of the river, close within the entrance, and provides a good landmark. A water tank is conspicuous 0.3 mile S of the W entrance point of the river. A conspicuous radio mast, 105m high and marked by obstruction lights, stands 2 miles SW of the same entrance point.

Anchorage.—Anchorage can be taken in depths of 8.2 to 9.2m, mud and sand, good holding ground, 0.8 mile SSE of Tanjung Tembeling.

Anchorage is also available 2.3 miles SE of Tanjung Tembeling in a depth of 12m.

Kuantan to Tanjung Penyabong

6.73 The coast between the entrance to Sungai Kuantan and the N entrance to Sungai Pahang, 18 miles SSE, is low and densely wooded.

Sungai Pahang has two mouths formed by **Pulau Syed Hasan** (Pulau Syed Hassan) (3°31'N., 103°29'E.). The river is shallow and the banks constantly change.

Kuala Pahang Light is shown close N of the N entrance point of Sungai Pahang.

Batu Serandu, a reef supporting a fishing reserve, has a depth of 5.5m, and lies 3 miles NNW of the N entrance point of Sungai Pahang.

Bass Shoals, consisting of several heads with depths of 9.8 to 10.7m, extends up to 7 miles E of the entrance to Sungai Pahang. Cardno Shoals, with a least depth of 8m, lies 4 miles SE of Pulau Syed Hasan.

Anchorage can be taken, in a depth of 8.2m, mud and sand, 1 mile NE of Kuala Pahang Light.

Wardlaw Shoals, consisting of patches of coral rising steeply from the bottom, and with a least depth of 1.2m, lies 3.5 miles S of Pulau Syed Hasan; depths of less than 5.5m extend about 1 mile farther S.

The coast from the S entrance of Sungai Pahang to abreast Wardlaw Shoals is densely wooded, then the coast to Tanjung Batu, 16 miles S, consists mainly of sandy beaches. A wooded hill, 41m high, rises 1 mile N of Tanjung Batu.

A narrow shoal, 1.5 miles long in a N-S direction, and with a least depth of 3m, lies with its S end lying 2.5 miles NE of Tanjung Batu. A shoal, with a least depth of 3.4m, lies 6.5 miles farther N. A 7m patch lies 5 miles ENE of the above-mentioned narrow bank.

A light is shown at Nenasi, a fairly large fishing settlement, situated 3.5 miles S of Tanjung Batu.

6.74 Off-lying islets and dangers.—**Pulau Berhala** (3°15'N., 103°39'E.), a wooded, steep-sided islet, 28m high and marked by a light, lies 13 miles ENE of Tanjung Batu. A ledge of rocks, 0.3m high, over which the sea breaks in bad weather, extends 0.3 mile NNE of the islet. A shoal, with a least depth of 10m, and a 10m patch, lie 4.5 miles NW, and 7.5 miles N, respectively, of Pulau Berhala.

Jubilee Shoal, a steep-to coral patch, with a least depth of 8.8m, lies 9 miles E of Pulau Berhala. A depth of 15.5m lies 10.5 miles NE of Jubilee Shoal.

Bell Shoal, with a depth of 15.8m, lies 18 miles NNE of Pulau Berhala. Tucker Shoals, a number of detached shoals, with a least depth of 12.8m, extends 10 miles SSE from Bell Shoal.

The coast from **Nenasi** (3°08'N., 103°27'E.) to the entrance of Sungai Rompin, 19 miles S, consists of a series of long, sandy beaches, fringed by a line of casuarinas and backed by flat jungle country. Settlements are distinguished by the coconut palms which surround them.

Sungai Bebar, navigable at HW, enters the sea from within a sandy spit, parallel with the coast and extending S of Nenasi. Sungai Mercung, suitable for boats, lies 6 miles farther S.

Margaret Shoal, a detached bank 13.5 miles in length within its 5.5m contour, lies with its N end lying 5.5 miles E of Nenasi light structure. A patch, with a least depth of 1.5m, lies near its S end, 3 miles offshore. An extensive shoal, with a least depth of 10m, lies 6.5 miles E of the S part of Margaret Shoal.

A radio tower, marked by a red obstruction light, stands on the N entrance point of Sungai (Sungei) Rompin.

The mouth of Sungai Rompin is fronted by a bar with a least depth of 1.1m. No attempt should be made to enter the river without local knowledge as changes occur every monsoon. The port is little used except by fishing craft. The limits of the port of Kuala Rompin are comprised between the parallels of 2°53'24"N and 2°45'00"N, and W of 103°36'48"E.

A light is shown from the head of the Kuala Rompin jetty situated on the S side of the river.

Vessels working cargo via Sungai Rompin should anchor within the port limits, N of 2°49'18"N. Vessels working cargo via Sungai Pontian, a river with a drying bar 3 miles SE of Sungai Rompin, should anchor within the limits, S of 2°49'18"N.

6.75 Pulau Duchong Laut, 43m high, lies 2.5 miles ESE of the entrance to Sungai Pontian. Drying rocks lie NE of the islet, and another islet, 35m high, lies 0.8 mile S.

Boya Rock, 0.3m high, lies 3 miles E of Pulau Duchong Laut. A light is shown from Boya Rock.

The coast between Sungai Rompin and **Tanjung Penyabong** (2°39'N., 103°45'E.), 19 miles ESE, is fairly low except for an isolated hill, 129m high, standing 3.5 miles from the coast, abreast of Pulau Duchong Laut.

Kuala Endau, entered 6.5 miles WNW is obstructed by a bar, with depths of 0.9 to 1.5m, extending 1.5 miles offshore. A light is shown from the E entrance point of Sungai Endau; the light structure is difficult to identify from seaward. Robb Shoals, an extensive rocky patch, lies with its least depth of 2.4m about 3.2 miles N of the river entrance. Iron ore and tin are exported from the town of Endau, 1 mile within the river entrance.

Anchorage can be taken in depths of 12.8 to 16.5m, mud, good holding ground, about 5.3 miles NE of the river entrance.

Pulau Acheh (Pulau Kaban) (2°40'N., 103°46'E.), located 1 mile NE of Tanjung Penyabong, has several summits, the highest rising to 154m at its SE end. A small islet, 43m high, lies close off the NW end of the island.

Pulau Tengah, 76m high, is the N of a group of islets and rocks extending 1 mile N of the NW extremity of Tanjung Penyabong.

Pulau Tunus and Pulau Layak lie on the N side of Blair Harbor, about 1 mile, and 2 miles, respectively, NW of Pulau Acheh. Pulau Tunus consists of three islets, the highest with an elevation of 43m. Pulau Layak is 78m high at its SE end. Batu Doyak, which dries 1.8m, lies 0.7 mile S of Pulau Layak.

A rock awash, and a rock with a depth of 5.5m, lie 0.5 mile SW, and 0.7 mile SE of the S end of Pulau Acheh.

Anchorage for small vessels with local knowledge can be taken in a depth of 7.3m, stiff mud, W of Pulau Acheh between the islets NW and Pulau Tengah.

Tanjung Penyabong to Tanjung Sekakap

6.76 Two shallow bays, separated by Pulau Mawar, indent the coast between Tanjung Penyabong and Tanjung Resang, 5 miles SE. Pulau Mawar consists of two islets; the SE and larger islet is 72m high, and the NW islet has two conspicuous pillar rocks, 24m high. Malang Gading, 1.3 miles N of Pulau Mawar, consists of two groups of rocks, 0.2 mile apart, the N of which is 3.4m high.

Tanjung Resang rises to an elevation of 75m. Bukit Arong, 238m high, is easily identified 1.5 miles SW of Tanjung Resang. Pulau Puchong, 15m high, is located 1 mile SE of the same point.

Tanjung Selantai, 143m high, is located 5 miles SSE of Tanjung Resang. Pulau Batu Gajah (Batu Gaja), 45m high, is located 1 mile SSE of Tanjung Selantai. Pulau Stindan, 85m high and marked by a light at its SE end, is located 1.5 miles S of the same point.

Caution.—Between Pulau Acheh and Tanjung Selantai, there are numerous fishing stakes which extend offshore to depths of 15m in places. During the Northeast Monsoon these stakes are frequently destroyed, and wooden stakes, often submerged, are dangerous to small craft, and may be encountered anywhere along the coast.

6.77 Mersing (2°26'N., 103°51'E.) lies at the mouth of Sungai Mersing, 2.5 miles S of Pulau Setindan. A light, difficult to distinguish against the lights of the town, is shown on the S side of the river entrance. A green-tiled dome is conspicuous in the town, 0.3 mile S of the light. Batu Chawang, a 10m high red rock, lying 1 mile E of the river entrance, is a good landmark. A meteorological hut with a flagstaff is conspicuous on a hill about 1 mile NW of the river entrance. The bar off the entrance of the river is passable by boats, and has varying depths. The bar was reported to dry at LW.

Anchorage, according to draft, can be taken NE of the river entrance; the bottom is very flat, and consists of mud, sand, and shell.

Two radio masts, marked by obstruction lights, stand at an elevation of 114m, about 3 miles S of Sungai Mersing, at the S end of a range of hills.

Tanjung Sekakap, 107m high, is located 8 miles SE of Sungai Mersing. Pulau Blalah, a small islet, 27m high, lies close to the coast 1.3 miles NW of the point. A shoal with a least depth of 8.2m lies 3 miles NNE of Tanjung Sekakap.

Off-lying Islands and Dangers

6.78 Pulau Sembilang (2°42'N., 103°53'E.), 234m high on its NW side, lies 7.5 miles ENE of Tanjung Penyabong. Pulau Sribuat (Pulau Siribuat), 139m high at its SE end, is separated from Pulau Sembilang, close W, by a foul channel. Pulau Santu, 72m high and grass-covered, lies nearly 0.5 mile E of the NE end of Pulau Sribuat.

Mitchell Patches, an extensive bank, has a least known depth of 10.4m lying 1.7 miles N of the NW end of Pulau Sribuat. A depth of 8.5m lies 1.8 miles SE of the S end of Pulau Sembilang, then a reef, with depths of 7.3 to 11m, extends NW almost to the island.

Anchorage, well-sheltered from S, can be taken in a depth of 14m, mud, sand, and shell, 1 mile NW of the NW end of Pulau Sribuat, on the S end of Mitchell Patches. Good anchorage can also be taken in a depth of 16.5m, mud and sand, 1.2 miles SE of Pulau Sribuat, on the bank extending SE from the island.

Pulau Mertang Barat (Pulau Achi), 2 miles SW of Pulau Sribuat, is 59m high, and the NW and highest of three rocky islets lying close together. Depths of less than 11m extend 0.4 mile W of Pulau Mertang Barat, and 0.4 mile SE of the SE islet. A light is shown from Pulau Mertang Barat.

Remora Patches lie with a least depth of 13.7m lying 6 miles NW of Pulau Mertang Barat. Burden Patches has a depth of 10.1m lying 2 miles SW of the same islet and a 10.4m depth lying 2 miles farther S.

Pulau Harimau, located 6.5 miles SE of Pulau Mertang Barat, is 91m high and steep-to except on its SW side where there are sunken rocks. It is the NW and largest of a chain of islets and rocks extending 3 miles SE, and which lie on the same submerged ridge as Pulau Mertang Barat. A bank, with a least depth of 11.6m, lies 2.5 miles NW of Pulau Harimau.

6.79 Pulau Mensirip, 49m high and tree-covered, lies 0.7 mile SE of Pulau Harimau; the fairway between the two islands is free of dangers. Pulau Rawa, 113m high, is located 2 miles farther SE and is the SE islet of the group.

Pulau Babi Kechil North, 122m high, lies 2 miles SW of Pulau Rawa. Pulau Babi Kechil South lies 0.5 mile SSE of Pulau Babi Kechil North, from which it is separated by foul ground. A rock, 4.9m high, lies 0.2 mile off the E side of Pulau Babi Tengah. Both islands are planted with coconut palms, and there are sandy beaches on the SW sides, but the NE sides are steep and rocky.

Anchorage can be taken in a depth of 20m, mud and sand, midway between Pulau Rawa and Pulau Babi Kechil North.

Pulau Babi Besar, lying 1.2 miles SSE of Pulau Babi Kechil South, is thickly wooded, with four separate summits, the highest of which is 252m high, in its SE part. It is fringed by rocks and reefs extending up to 0.2 mile offshore. A bank, with depths of 5.5 to 11m, extends 1.3 miles S of the island. A

detached 5.5m shoal lies 1.3 miles SW of the island. In the channel between Pulau Babi Besar and the mainland, a bank with a least depth of 10.6m and another bank, with a least depth of 8.2m, lie 2 miles WNW and SW, respectively, of the 5.5m shoal.

Batu Sakit Mata, 1.5m high, is located 2.5 miles E of the N end of Pulau Babi Besar, and Batu Tikus, 8.5m high, is located 2.5 miles farther SE. They are rocky outcrops on a bank with general depths of 12.8 to 18.3m.

Pulau Tioman

6.80 Pulau Tioman (2°47'N., 104°10'E.), the largest island off the E coast of Malaysia, consists of lofty mountains. Gunong Kajang, the largest and highest peak, 1,053m high, rises 5 miles NW of Tanjung Lanting, the SE extremity of the island. A light is shown from Tanjung Lanting.

A conspicuous twin-peaked hill, 456m high, is located near Tanjung Lanting; a flat-topped mountain, 957m high, is conspicuous 2 miles farther NW. Bukit Perayon, 419m high, the N summit of the island, is easily identified. The island is covered with jungle, with some cultivation limited to the coastal strip. The presence of coconut palms indicates the location of the inhabitants of the island. The island has been reported visible from distances of more than 50 miles at times.

The E side of Pulau Tioman, apart from Telok Juara, is steep-to, rugged and rocky, with no off-lying dangers. The N entrance point of Telok Juara, 5 miles N of Tanjung Lanting, rises abruptly to a height of 183m. Above-water rocks extend 0.2 mile SE of the point, and a 4.6m rocky shoal, and an 11m patch, lie 0.3 mile SE and 0.4 mile SSW of the same point. The cove is about 1.2 miles wide between its entrance points, and recedes 0.8 mile W to a sandy beach bisected by a small headland. The 10m curve fronts the W shore of the cove nearly 0.5 mile offshore.

Anchorage in depths of 11 to 18.3m, mud under sand, good holding ground, can be taken in the SW part of the cove.

Telok Mokut, a sandy bay, indents the coast between Tanjung Lanting and Tanjung Duata, located 4 miles W. Two conspicuous outcrops of rock with twin summits, 760m high, rise close N and NW of Tanjung Duata. Anchorage with local knowledge and in fine weather, can be taken in Telok Mokut in depths of 26 to 28m, sand.

The SW coast of Pulau Tioman from Tanjung Duata to Tanjung Bongkil, 4.2 miles NNW is steep-to, with the 10m curve at no point lying more than 0.3 mile offshore.

Pulau Tumuk, a small wooded islet, 34m high, lies 0.5 mile NNE of Tanjung Bongkil. Tanjung Batu Panjang lies 0.7 mile farther NE. A radio mast stands on Tanjung Batu Panjang.

Telok Tekek (Telok Telek) is entered between Tanjung Batu Panjang and Tanjung Penuba, 3.5 miles NNE. Pulau Rengis, a small rocky islet, 24m high, lies 0.8 mile NE of Tanjung Batu Panjang. A shallow bank of sand and coral, with a depth of 10.4m at its outer end, extends 0.4 mile W of Pulau Rengis. Within the bay the 20m curve fronts the coast 0.3 mile offshore with the exception of the bank off Pulau Rengis. Within the 20m curve the depths decrease very rapidly and there are numerous coral heads.

Anchorage can be taken anywhere in Telok Tekek, NE of Pulau Rengis, in depths of 26 to 37m, mud and shells, good holding ground.

An offshore current flowing NE attaining velocities of 1 to 2 knots has been reported in the vicinity of the bay.

Pulau Soyah, 37m high, lies close offshore, 1.3 miles N of Tanjung Penuba. Between Tanjung Penuba and Tanjung Gua Layang, the N extremity of Pulau Tioman, the 30m curve lies at distances of no more than about 0.4 mile offshore.

6.81 Off-lying islets and dangers.—Magicienne Rock, with a depth of 8.2m, lies 2 miles NW of the N extremity of Pulau Tioman.

Pulau Tulai lies 3 miles WNW of the NW extremity of Pulau Tioman. The island is densely wooded, and has several summits, the highest rising 123m on the E side of the island. Two above-water rocks lie off the S side of the island.

Pulau Chebeh, 72m high and nearly 1 mile NNW of Pulau Tulai, is a steep-to rocky islet with few trees on it.

Pulau Sepoi, a rocky islet, 73m high, lies 3 miles WSW of Pulau Tulai. Pulau Labas, a bare rocky islet, 20m high, lies 1 mile SE of Pulau Sepoi. A comparatively shallow bank extends between the two islets, with a 10.1m depth lying 0.2 mile SE of Pulau Sepoi. Karang Tohor, with a least depth of 14m, lies 1.5 miles SSW of Pulau Labas.

Pulau Burong 9.5 miles W of the W extremity of Pulau Tioman, is a group of three rocky islets; the N and largest islet is 53m high.

Pulau Gut, 4.5 miles SW of Tanjung Lanting, is 49m high to the tops of the trees. It is steep-to except off its S side where depths of less than 5.5m extend 0.2 mile offshore. Batu Sepoy, with a least depth of 2.4m, lies nearly 1 mile N of Pulau Gut.

Pulau Tokong Bahara (2°40'N., 104°04'E.) is a bare rock, 57m high, marked by a light close NNW, and lies 6.5 miles W of Pulau Gut. Two detached rocks lie about 0.3 mile NNW of the islet.

Pulau Pemanggil

6.82 Pulau Pemanggil (2°35'N., 104°20'E.), 9.5 miles SE of Pulau Tioman, has two main peaks and a number of subsidiary peaks. The SE and highest peak, 433m high, rises abruptly from the end of the island; the NW peak, 386m high, is less distinctive. A dome-shaped rocky summit, with smooth vertical sides, rises to a height of 319m about 0.5 mile SSW.

The island is steep-to on all sides, but is partially fringed by narrow coral reefs and rocks close inshore, particularly in the bays. A rock, which dries 2.1m, lies 0.1 mile offshore in the N part of Telok Kador, a bay on the NE side of the island. Coconut-palm plantations distinguish the inhabited part of the island, close to the shore of the two bays on the SW side of the island.

Good anchorage can be found in depths of 33 to 39m, sand and shell, as convenient, off the SW coast of Pulau Pemanggil.

Pulau Aur (2°27'N., 104°31'E.), 11.5 miles SE of Pulau Pemanggil, is densely wooded, with two conspicuous peaks. The SE peak is 538m high, and the NW peak is 445m high. From NE or SW, the saddle-shaped island often appears as two islands from a great distance.

Pulau Pinang, 0.5 mile off the SE shore of Pulau Aur, is steep-sided, rocky, and 95m high. The channel between these two islands is deep and clear of dangers.

Three rocks and coral shoals, with depths of 9.2 to 10.1m, lie SW of Pulau Pinang, 0.8 mile off the SE coast of Pulau Aur. Strong tidal currents and current eddies may be encountered in this area which should be given a wide berth.

A target, consisting of a group of nine mooring buoys, lies 2.3 miles S of the SW end of Pulau Aur.

Pulau Dayang, 171m high, lies close NW of Pulau Aur, from which it is separated by a deep channel. A group of rocks, the largest 1.5m high, extends 0.7 mile E from the N end of the island. Pulau Lang, 55m high, lies 0.8 mile SW of Pulau Dayang, and 0.5 mile off the W end of Pulau Aur.

Anchorage.—Large vessels can obtain good shelter during the Northeast Monsoon off Telok To Kaya (Telok Kyahs) on the SW side of Pulau Aur, in a depth of 40m, sand, a distance of 0.5 mile offshore, with the left tangent of Pulau Aur bearing 335° and the right tangent bearing 117°. Within the bay the bottom is irregular and discolored water caused by tidal eddies give the impression of shoal water.

Excellent sheltered anchorage can be found in a depth of 42m, sand and shell, at the NW end of Pulau Aur, equidistant between that island, Pulau Dayang and Pulau Lang; swinging room is limited to about 0.3 mile. The W approaches on either side of Pulau Lang are deep and clear. The main village of Pulau Aur lies in a sheltered valley on the SE side of this anchorage.

Tanjung Sekakap to Tanjung Penawar

6.83 The coast between **Tanjung Sekakap** (2°21'N., 103°56'E.) and Tanjung Tenggaroh, located 6.5 miles SSE, is mainly steep, rocky, and interspersed with sandy beaches. Tanjung Murang, 2.5 miles SE of Tanjung Sekakap, rises to a height of 111m.

A light is shown from the easternmost part of Tanjung Tenggaroh; an abandoned lighthouse stands close SW.

The coast between Tanjung Tenggaroh and Tanjung Sedili Besar, 22 miles SSE, is mostly low and densely wooded. The coast between Tanjung Tenggaroh and Tanjung Leman, 6 miles SSE, is fringed by a bank with depths of less than 5.5m extending up to 2.3 miles offshore.

Off-lying Islands and Dangers

6.84 Batu Murau, 1.5m high, lies 4 miles E of Tanjung Murau, at the S end of a reef of about 0.5 mile in extent.

Pulau Tinggi (2°18'N., 104°07'E.), 4 miles farther E, rises to a conical peak, 609m high. Gebang Rocks, two rocks which dry 0.6m and on which the sea breaks during the Northeast Monsoon, lie 1.3 miles N of the island. Pulau Iboi, 105m high, with two drying rocks close E, is the outermost of two islets, 0.5 mile off the NE side of the island. Pulau Simbang, 44m high, lies near the SE edge of a bank with depths of less than 11m extending 1.8 miles SE of Pulau Tinggi. One Tree Rock, 22m high, lies close N of Pulau Simbang, with a detached rocky ledge, uncovered at most stages of the tide, close E.

6.85 Pulau Yu (Tokong Yu) (2°07'N., 104°15'E.), a bluff, wooded islet, 47m high, is the SE of a chain of islets and dangers extending 12 miles SE of Pulau Tinggi. A small shoal, with a least depth of 11.3m on its S side, lies 1.3 miles NW of Pulau Yu.

Tokong Chopak, 5m high, Tokong Blalang, 31m high, and Tokong Chondong, 43m high, are located 3.5, 5, and 5.8 miles, respectively, NW of Pulau Yu. A rocky ledge, with a least depth of 1.8m, joins Tokong Chondong to Tokong Gantang, 0.3 mile N, and then extends 0.1 mile N to a rock which dries 1.2m.

Pulau Lima Besar, with five distinctive pinnacles, 52m high, lies on a rocky bank lying 2 miles NW of Tokong Gantang. Tokong Sangoe, 21m high, is located nearly 1 mile W of Pulau Lima Besar, and Tokong Raket, two rocks, the highest 30m high, lies 0.5 mile ESE of Pulau Lima Besar. Karang Ambong, a rock with a depth of 0.9m, lies 0.5 mile SW of Pulau Lima Besar.

Pulau Sibul, 4 miles SW of Pulau Tinggi, is 154m high near its SE end, and 114m high near its NW end. A bank, with depths of less than 5.5m, extends 2 miles SE of Pulau Sibul. Pulau Sibul Tengah, 3.7m high, lies 1 mile SE of Pulau Sibul, and other islets and rocks extending 1 mile farther SE, lie on the SE edge of the above bank. Three patches, with a least depth of 4.3m, lie 0.5 mile NE of the N end of Pulau Sibul.

Sibul Channel, between Pulau Sibul and the mainland, is 2.5 miles wide between the 5m curves on either side, with depths of 9.8 to 15.2m in the fairway. The channel is encumbered by a number of patches on its NE side, the shallowest with depths of 5.2m and 7.6m, about 1.2 miles NW, and 0.8 mile WNW, respectively, of the NW end of Pulau Sibul.

Tanjung Sedili Besar (1°55'N., 104°08'E.) rises to an elevation of 47m. A light is shown from a 3.7m high rock, near the outer end of foul ground extending 1 mile SE of the point.

6.86 Telok Mahkota (Jason Bay), a shoal bay, is entered between Tanjung Sedili Besar and Tanjung Sedili Kechil, 4 miles SSE. A wreck, marked by a buoy, lies 5 miles E of Tanjung Sedili Kechil.

Sungai Sedili Besar enters the N end of the bay, between Tanjung Sedili Besar and Pulau Tagal, a densely wooded island, 0.5 mile W. Kampong Sedili Besar, a fishing village, lies on the E side of the river entrance. A pylon, 15m high, stands on a 0.6m high rock, about 0.1 mile N of Pulau Tagal; an overhead telephone cable extends from the pylon to the jetty at Kampong Sedili Besar. Tanjung Sedili Kechil is 85m high, and a reef extends 0.8 mile E of the point.

The coast between Tanjung Sedili Kechil and Tanjung Kelesa (Tanjung Klesa), 10 miles SSE, is backed by hills close inshore. Depths of less than 11m extend 2 to 3 miles offshore. Then the coast between Tanjung Kelesa and Tanjung Siang 4 miles farther SSE is bordered by trees about 43m high.

Tanjung Balau lies 2.5 miles SSE of Tanjung Siang. A group of rocks, the highest with an elevation of 3m, lies close offshore, 0.5 mile NW of Tanjung Balau.

Bukit Siti rises to a height of 137m about 3.5 miles WSW of Tanjung Siang.

Tanjung Penawar (1°31'N., 104°17'E.), located 6.5 miles SSE of Tanjung Balau, is a low point, 9 miles N of the NE entrance point of Singapore Strait. The coast for a distance of 1 mile N of Tanjung Penawar is bold, but with rocky patches extending 0.2 mile to 0.8 mile offshore. The 10m curve fronts the point about 2 miles offshore.

Bukit Twatow, 139m high, rises 2 miles WSW of Tanjung Penawar. The coast in this vicinity is rather low and wooded. Bukit Twatow, being discernible during hazy weather much sooner than Bukit Pelali, 191m high, 6 miles farther SSW, is a good landmark when approaching Singapore Strait from N.